

The newswweekly of enterprise network computing

NetworkWorld

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The network portal: www.nwfusion.com

Life

BY JEFF CARUSO



Life after Cisco

Leaving Cisco isn't an easy choice, though the company has gotten too big for some.

As the data network industry's most powerful player, Cisco has a name that conjures up fear, love, hate — and above all, respect.

By most accounts, you could do a lot worse than work for the San Jose firm, which has made more than a few employees wealthy beyond their dreams. Still, some of the people who helped raise Cisco to its current height have recently decided to leave their relatively comfortable jobs for the chance to build new companies from scratch. Why would anyone take such a gamble?

"I loved being at Cisco when it was a \$300 million company, and you could see changes and make things happen," says Nick Francis, who used to run the IBM business unit at Cisco. "But Cisco changed around me."

The fact is, in some ways Cisco is a victim of its own success. It went from plucky young router vendor to industry behemoth in just a few years — from \$69 million in revenue when it went public in 1990 to \$9.2 billion in the last four quarters. The kind of people who

See **Cisco**, page 64

AT&T WorldNet mops up its dial-up mess

The ISP's upgrades should cure dropped lines and congestion problems.

BY DENISE PAPPALARDO

AT&T WorldNet is embarking on a multimillion dollar upgrade to prevent its network from being overrun by a fast-growing customer base and exploding Internet access traffic.

AT&T's ISP arm acknowledges that it was blindsided by a sudden increase in customers, 100,000 of whom jumped on the network in January after the ISP began offering unlimited usage for \$21.95 per month.

And not only are more peo-

ple using the network — they're staying on longer because they have unlimited access.

The result has been an increase in busy signals, slow

connections and dropped lines, say WorldNet dial-up customers.

WorldNet is responding by upgrading dial-up points of presence in 59 cities across 24

See **AT&T**, page 65

Not prepared for the demand

AT&T WorldNet is upgrading its heavily stressed dial-up Internet access POPs in 24 states (shown in green). See page 65 for a complete list of affected cities.



SOURCE: AT&T, BASKING RIDGE, N.J.

Analysis tools get in tune with switched nets

BY JEFF CARUSO

Protocol analyzers are about to work much better in switched networks.

Network Associates will expand its Sniffer product line to monitor switches so net administrators can get traffic statistics across a switch's ports, detect configuration problems in virtual LANs, and track problems between switches and desktop machines. Network Associates is expected to lay out its full

See **Analyzers**, page 12

Novell house divided over NDS for NT giveaway

BY CHRISTINE BURNS

To be free or not to be free? That is the question Novell's brain trust is mulling as it considers the future of its directory for Windows NT networks.

Novell executives want to get Novell Directory Services (NDS) for NT installed in as

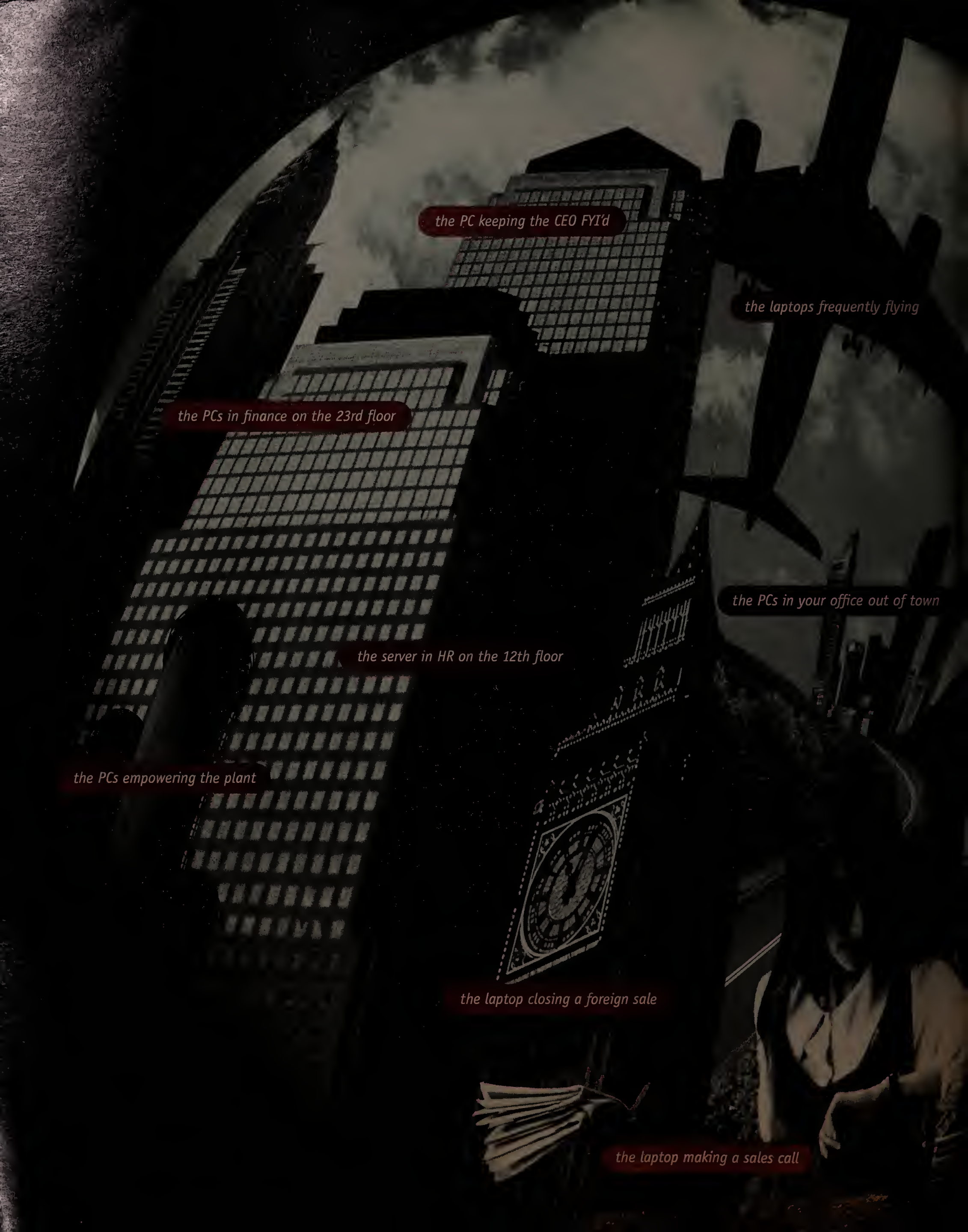
See **NDS**, page 14

More inside: Novell to revamp desktop and server management wares. Page 14

Online

A paper comparing NDS and Active Directory





the PC keeping the CEO FYI'd

the laptops frequently flying

the PCs in finance on the 23rd floor

the PCs in your office out of town

the server in HR on the 12th floor

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THIS WEEK ONLINE



Wireless when? Read our feature about the state of wireless services, on page 41, then head online. Todd Dagres, general partner at Battery Ventures, is online all week to argue that wireline services are here to stay. **DocFinder: 2023**

Are you getting a fair deal? We've got just what the doctor ordered — a career checkup. This week the Career Doctor, Shaun Kelly, will discuss how to demand a higher salary, better benefits and more opportunity. Share your work woes with him. **DocFinder: 2032**

Keeping Current. Can America Online single-handedly prop up the market for digital subscriber line services? Fred McClimans says the company's agreements with Bell Atlantic and SBC Communications indicate it can. **DocFinder: 2040.**



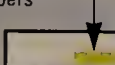
NDS vs. Active Directory. Read our front-page story, then come online for a paper that compares the Novell and Microsoft offerings. **DocFinder: 2035**

The reality of XML. Extensible Markup Language (XML) was once touted as the salve for search engines. But XML has fallen from grace. Major search players, such as Northern Light, AltaVista and Excite, told Network World Fusion that XML can bring more headaches than relief. **DocFinder: 2039**

Winning the name game. Check out our review of Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) products on page 49. Then add to your knowledge with a directory of DNS resources, a link to the IETF's DHCP Working Group and technical papers from Network Telesystems. **DocFinder: 2021**

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NetworkWorld

Table of Contents

MARCH

15, 1999

3 Lance Communications' Richard Perkett passes the time at work with his dog, Charlie. Page 54.

NEWS

- 6** Net storage for rent; Start-up to launch ambitious virtual private storage network.
- 8** Big Blue bolsters its front-end processor.
- 9** Cabletron sets its technical direction for turnaround.
- 10** The Scoop: Why the feds went after Intel.
- 10** Sun says two Java browsers are better than one.
- 12** Hewlett-Packard's reorganization, take two.
- 14** Novell to debut management tools.
- 64** Life at Cisco: The benefits of working for the router giant.

INFRASTRUCTURE

- 15** Server vendors rally around the Pentium III.
- 15** AIX is not just for IBM users anymore.
- 20** NCD extends thin-client software to PCs.
- 22** Dave Kearns: When noise means nothing.

CARRIERS & ISPs

- 23** Siemens takes aim at the data network field.

- 24** Daniel Briere and Christine Heckart: A baby step for new providers.

ENTERPRISE APPLICATIONS

- 25** Could you pass this tough security test?
- 25** Foundry steals Cisco load-balancing customers.
- 26** Scott Bradner: Microsoft's unprincipled action.

TECHNOLOGY UPDATE

- 33** Boosting SONET's high-speed capacity.

- 38** Gearhead: IP Security — keeping your business private.

MANAGEMENT

- 54** Work like a dog: Four-legged friends brighten the daily routine at high-tech companies.

OPINIONS

- 38** Editorial: Stop managing all those stovepipes!
- 39** Ira Brodsky: How IP networks will conquer telecom.
- 39** Thomas Nolle: Coming soon — a sea change for the CLECs.
- 66** Backspin: Free speech and shouting madmen.
- 66** 'Net Buzz: Gazing into the e-commerce crystal ball.

- Net Know-It-AllPage 10
- Ask Dr. IntranetPage 33
- Message QueuePage 38
- Editorial and advertiser indexesPage 63

Special Focus

NEW WEB TOOLS

XML servers are enabling e-commerce and Web models. Page 30.

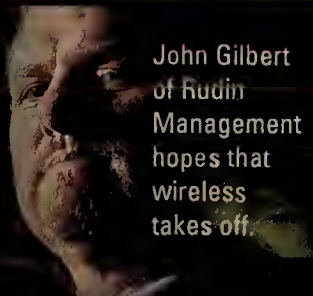
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FEATURES

Whither the wireless dream?

Venture capital firms continue to pour money into wireless start-ups, but the investments aren't likely to yield a windfall of corporate wireless services. Page 41.



John Gilbert of Rudin Management hopes that wireless takes off.

DIGITAL POWERLINE SHORTS OUT IN U.S.: Hurdles stall the deployment of a technology for carrying corporate data over electric power lines, although there is hope for a small business and consumer rollout. Page 47.

REVIEW: The key to managing IP addresses is having DNS and DHCP tools that work well together. Page 49.

REVIEW: The scaled-down Unicenter component for general network management isn't scaled down enough. Page 45.

NEWS BRIEFS, MARCH 15, 1999

Al Gore's great Internet goof

It sounded like something former Vice President Dan Quayle would say. But it was current Vice President Al Gore who last week dumbfounded observers by saying during an interview with CNN that he, "took the initiative in creating the Internet." Republicans on Capitol Hill took little time taking Gore to task on his gaffe. Noting that it was scientists at the Defense Advanced Research Projects Agency who launched the Internet in 1969, House Majority Leader Dick Armey (R-Texas) said it's common in Washington, D.C. to steal an idea, but "claiming credit for the Internet insults its real creators."



Y2K sneak preview?

You might think Wall Street would be better at handling prosperity. By the time you read this, however, the Dow Jones Industrial Average may have blasted through the once-unthinkable 10,000 barrier, in the process giving the IT world a sneak preview of the Year 2000 headaches to come. The potential problem has a familiar ring for anyone who has wrestled with Y2K. Some brokerage software systems were written by folks who could not fathom a five-digit Dow. Consequently, a Dow of, say, 10,121 might be interpreted by an application as 1,012 or even 121, thus wreaking havoc on automatic transaction systems. A spate of publicity last spring prompted many brokerages to take corrective measures, which they and industry experts last week were hoping would be sufficient to forestall significant fallout from any swing into five-digit territory. If experts turn out to be wrong, expect the public's Y2K panic to ratchet up a few notches.

Microsoft happenings

Microsoft this week is expected to announce a corporate reorganization that will split the company into four major groups. The restructuring plan is the brainchild of Microsoft President Steve Ballmer. At its heart, the plan seeks to reorganize the company around the needs of broad groups of Microsoft customers, rather than around particular product lines and engineering efforts.

Separately, Microsoft last week acknowledged a security flaw in Windows NT that could grant interlopers unauthorized access to protected files on a workstation or even deny users access to a Windows NT server. The vulnerability in NT is exploited by running a malicious program when a

system is in screensaver mode. The program can elevate the user's log-on status to that of an administrator, giving the user access to protected files. Microsoft officials say a patch will be posted at www.microsoft.com/security.

U.S. workers to feel most of Alcatel's financial pain

So much for investing in the U.S. worker. While it has shelled out nearly \$2.7 billion for U.S. data network companies in the past year, French telecom giant Alcatel last week said it plans to cut 12,000 jobs over the next two years, mainly in the U.S.

Most of the job cuts, which amount to 10% of the company's work force, will result from the restructuring of Alcatel's U.S. operations, says Chairman Serge Tchuruk.

Even with the cuts, Alcatel will fail to meet an operating profit target of 8% of revenue this year, Tchuruk says. Alcatel most recently bought equipment makers Xylan and Assured Access (NW, March 8, page 12), and Gigabit Ethernet vendor Packet Engines.



Alcatel's Tchuruk says reorganization will cost U.S. jobs.

Unholy alliance

Digital subscriber line (DSL) deployment will get a big boost this week from an eclectic group of big-name companies. Intel, Hewlett-Packard, Microsoft and Nortel Networks will announce cooperation on making their diverse products DSL-friendly. Ideally, the group will work something like this: Intel Pentium III-powered HP PCs running a Microsoft Windows operating system with DSL drivers using Nortel's DSL modem technology will be sold as a complete package to customers and service providers.

You, special you

Hey readers! As part of our bimonthly Signature Series issues, we'll be devoting our July 26 issue to you — your jobs and hobbies, your gripes and delights. We're even offering readers a chance to win a spot on the cover of the You Issue. All you have to do is be the *Network World* reader who works in the most unusual spot in the world, has the coolest hobby or dedicates time to the worthiest cause.

If you think you or one of your peers qualifies, fill out our survey, available at www.nwfusion.com, DocFinder:1837. You can also e-mail your qualifications to Julie Bort, Signature Series senior editor, at jbort@nww.com. Entries are due by April 12.

Net storage for rent

Start-up StorageNetworks to launch national service for housing, accessing data.

BY DENI CONNOR

WELLESLEY HILLS, MASS. — Anticipating that companies' storage needs will continue to explode, start-up StorageNetworks, Inc. is readying a nationwide network of storage resources that will be available to customers on an as-needed basis.

The company, formed by a pair of storage industry veterans, says customers would rather rent capacity than constantly upgrade their internal storage resources as users of e-mail and other network applications generate ever-

help customers set up failproof storage networks at their own sites, he says. In addition, the company will offer business recovery services.

StorageNetworks, which has secured \$10 million in venture funding, is still in the early stages of building a network that is scheduled to have 15 points of presence in major U.S. cities by the end of 2000.

The first POP went up in Houston, and the next is planned for New York.

Each POP will be a secure site housing disk drives, backup systems, robotic tape

PROFILE: STORAGENETWORKS

Based:	Wellesley Hills, Mass.
Founded:	March 1997
Management:	Peter Bills, CEO and president, formerly of EMC; Bill Miller, chief technology officer, formerly of Andataco
Primary business:	Storage outsourcing services
Funding:	\$10 million from Sigma Partners, Greylock, private investors
Employees:	25

increasing amounts of data.

While StorageNetworks declined to release specific prices, the company claims some of its customers will be able to slash their storage costs by nearly half, largely by reducing IT labor costs.

"StorageNetworks can provide companies with the same storage at a lesser cost than owning it," says Bob Davoli, general partner at Sigma Partners in Boston, one of the start-up's venture capital investors.

"There's no reason for companies to allocate more space, buy more disks and hire more people to manage their storage when it can be outsourced," he says.

The new company hopes to begin offering access to its network by mid-year, says Tom Lahive, a former Dataquest analyst who is StorageNetworks' director of marketing.

The company also plans to

libraries and other storage resources for Windows NT and Unix users.

Customers' sites will be outfitted with "SNI plugs" — switches providing Fibre Channel access to the POPs, which will be connected to one another via fiber-optic lines and Fibre Channel extenders.

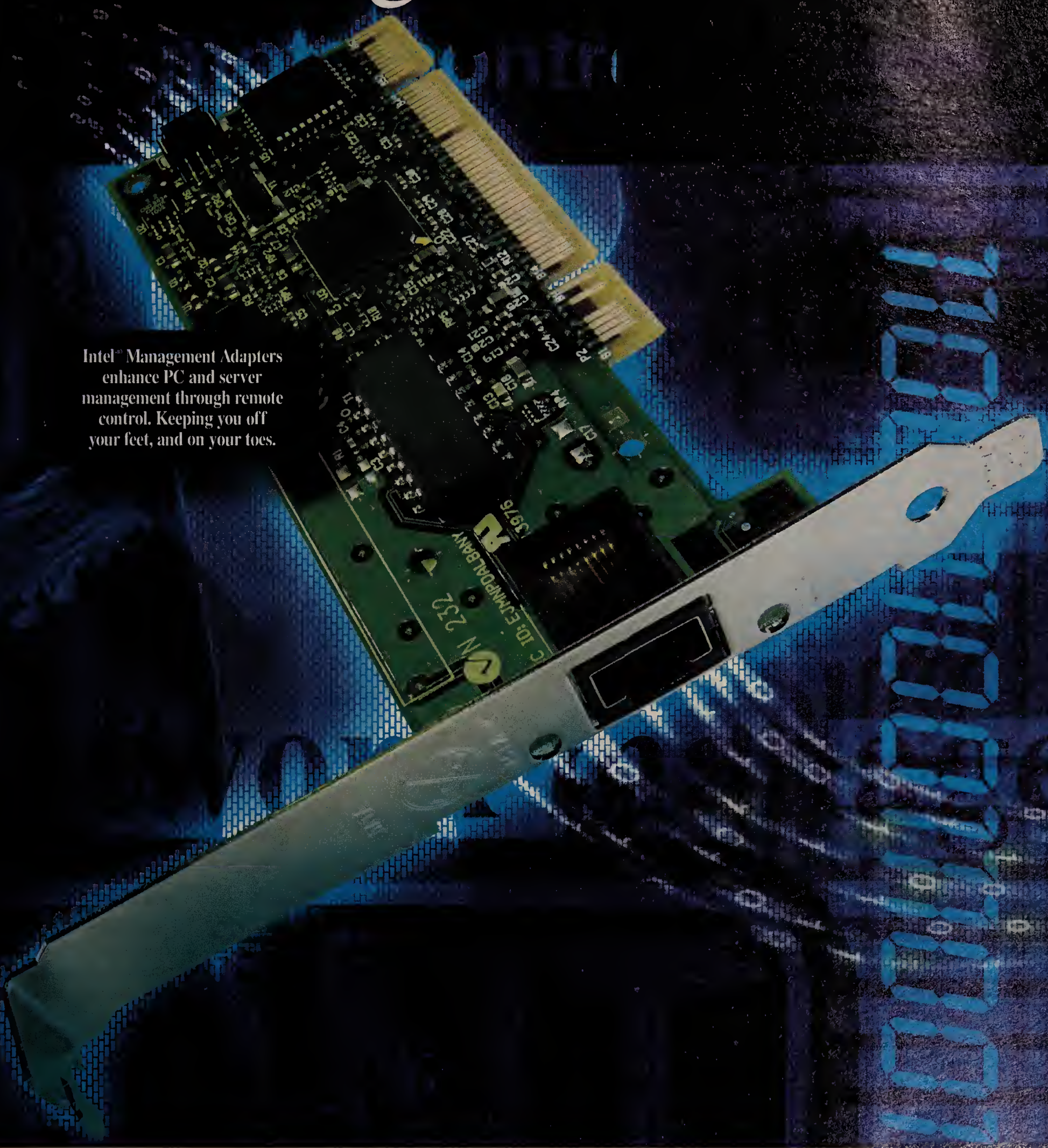
Customers' data will be kept on separate storage devices at the POPs, and customers will be able to request more storage or return storage capacity on the fly.

The company says customers will be able to access stored data from POPs up to 20 miles away about as quickly as they can from local networks.

StorageNetworks officials say the company also will be able to link customers to its POPs from hundreds of miles away using fiber-optic extenders.

See **Storage**, page 65

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Big Blue bolsters front-end processor

BY MARC SONGINI

RESEARCH TRIANGLE PARK, N.C. — IBM is fighting to keep its 3746 front-end processor as the IP-SNA gateway of choice for mainframe users.

Sources say IBM's Networking Hardware Division later this month will announce a software and network interface card upgrade for the 3746 that can support more IP and SNA Token Ring users. IBM declined to comment on the announcement.

IBM will nearly quadruple the number of simultaneous tn3270e sessions the 3746 can handle, from 4,000 to 15,000. Tn3270e technology lets 3270 users access SNA applications on the mainframe over TCP/IP nets.

With increased tn3270e support, Big Blue hopes to keep up with



IBM's 3746 is expected to get a big boost in scalability and connectivity.

Cisco's mainframe channel-attached router. Cisco's 75XX router running a Channel Interface Processor supports up to 16,000 tn3270e sessions simultaneously, Cisco claims.

IBM and Cisco are trying to address user demand for products that more easily merge large SNA networks with TCP/IP backbones. International Data Corp. says tn3270 shipments will grow from about 26 million today to over 31 million by 2000. IBM has 3746s installed at an estimated 40,000+ sites.

For traditional SNA Token Ring users, the 3746's Type 3 adapter will be upgraded to support 3,000 physical units, up from the current 2,000. A physical unit is typically a workstation or router.

The software upgrade will also permit load balancing and failover between token-ring ports on the 3746. By distributing the workload among the ports, the 3746 can prevent bottlenecks and increase throughput.

The session boosts are respectable and should appeal to mainframe shops, says Ian Blair, general systems administrator at Dalhousie University in Halifax, Nova Scotia: "If it can be done, that's great." Blair's network, which has a 15-year-old IBM mainframe running tn3270e sessions to about 20,000 students, sometimes slows under heavy demand. The increase in session support could remedy such a problem, he says.

Among other new enhancements expected for the 3746 will be a two-fold increase in capacity on its

Enterprise Systems Connection (ESCON) card, sources say. ESCON is IBM's fiber backbone technology. The 3746's ESCON card will be able to

communicate with up to 32 Logical Partitions (LPAR) on a mainframe. LPAR technology lets users divide mainframe processors and run them as

individual units. The enhancement should appeal especially to network executives who want to strap multiple LPARs together in parallel sysplex, or a mainframe cluster.

Sources expect the 3746 upgrades to be available in the third quarter.

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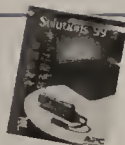


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Cabletron sets technical direction for turnaround

BY JIM DUFFY

ROCHESTER, N.H. — In an effort to appear focused during a time of finan-

cial uncertainty, Cabletron officials last week disclosed the company's technical direction for the year.

The company is attempting to more

closely align its product development efforts with customers' business objectives, such as tracking the cost of IT ownership. Cabletron's plan addresses

service providers as well as existing government and enterprise accounts, and emphasizes software and professional services.

Cabletron's Spectrum network management software, which has been lauded by industry pundits for its technical sophistication, could be the company's crown jewel. Spectrum development is "the most important thing we're doing right now," says Michael Skubisz, Cabletron's chief technology officer.

Cabletron is looking to get back on track after several money-losing quarters. Analysts and other observers have gone as far as to call for a change of leadership at the company and have questioned whether Cabletron can be a significant player in the future (NW, Feb. 8, page 1).

Skubisz admits Cabletron's been doing some "soul searching" for the past nine months.

"Our product line is healthy, but the issue that plagues us now is that we haven't been focused over the past couple of years," he says.

The soul searching resulted in a technical focus on:

- Directory, policy and accounting services
- Voice over IP and convergence
- Virtual private networks
- IP Multicast
- Service-level management
- Emerging transport technologies

Cabletron's directory services are an outgrowth of the company's SecureFast Virtual Networking Services software, which has been around for approximately five years. Cabletron has installed about 10 million directory-enabled switch ports at 3,000 customer sites, Skubisz claims.

Cabletron plans to tightly integrate its directory with its Spectrum management platform and with network operating systems such as Novell's NetWare. Cabletron will demonstrate interoperability between Spectrum and Novell Directory Services (NDS) at Novell's BrainShare conference next week.

"This is a match made in heaven, NDS and Spectrum," says Laura DiDio, a senior analyst at Giga Information Group in Newton, Mass. "This could be DEN without Microsoft and Cisco."

DEN is the Directory-Enabled Networking initiative kicked off by Microsoft and Cisco three years ago. It seeks to add intelligence to network devices by having them respond to and enforce network access policies. ■



Skubisz claims Cabletron has been searching its soul to develop a company focus.

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The Scoop

The news behind the news

WHY THE FEDS WENT AFTER INTEL

Last week, just before going to trial, Intel and the Federal Trade Commission (FTC) settled their differences. The agreement, which has been under wraps, prevented an antitrust trial that no one seemed to relish.

What was the cause of this trial? The FTC claimed Intel withheld technical information about its products from companies that refused to give Intel patented property on a royalty-free basis.

Further, Intel tried to make vendors buy licenses to Intel's intellectual property, such as its microprocessors. This, the government claimed, would stifle innovation and development because these companies would be less likely to develop their own chip technologies.

Digital Equipment and Compaq, at the time still separate companies, complained about Intel's policies. And Intergraph, which claimed its business had suffered, filed suit. Reacting to the Intergraph action, the government said Intel couldn't hold back technical information just because it was being sued.

But as the government's trial drew nearer, it appeared that much of the FTC's case against Intel was crumbling.

The now-united Digital and Compaq conceded in pre-trial testimony that Intel's hardball maneuvers had not stifled their technical innovations. Robert Palmer, former CEO of Digital, testified that research and development continued on the company's Alpha processor; one of his cohorts, in a deposition, said that Digital is "very committed" to the Alpha.

Despite the FTC-Intel settlement, the FTC will continue its investigation of Intel but is dropping its focus on monopolistic practices. While Intel may have had a monopoly last summer when the FTC brought the suit, since then the company's market share has been dropping.

Unlike Microsoft, which has some 90% of the PC operating system market, figures from International Data Corp. show that Intel now has 75% of the PC microprocessor market.

Why settle the case? The agreement stipulates that no one from either side can comment, a silence that has led to all sorts of speculation.

Some believe that the government was going to have a tough time proving its case — Intel's monopoly, if that was indeed what it was, was waning.

Intel had admitted to hardball tactics, but company officials maintained that these tactics were legal. Some observers believe Intel settled to avoid negative publicity.

Had the FTC proved that Intel was a monopoly, private lawsuits may have followed, much like the one filed by Intergraph, others argue.

Intel and the feds seem happy with their settlement. About the only company not satisfied is Intergraph, which will continue its suit, company officials pledge.

— Deni Connor

Sun says two Java browsers are better than one

BY JOHN COX

PALO ALTO — If you had any doubts about Sun's commitment to Java, its browser strategy should lay your fears to rest. The computer giant is developing not just one, but two new Web browsers written entirely in Java.

The products, one brand-new and the other a revamp of the HotJava browser, will not compete directly with PC-based browsers from Microsoft and Netscape.

Instead, Sun will aim the Java browsers at an array of so-called thin clients: everything from network computers and high-end TV set-top boxes to personal digital assistants and cellular phones.

Sun's approach is that of a wholesaler

— selling the new browsers to equipment vendors and Web application developers that will build the Sun software directly into their applications.

Sun first released HotJava about two years ago, after numerous delays that forced the company to abandon its hopes of competing against Netscape and Microsoft. Sun hoped that Netscape would help spread the Java message, but Netscape gave up trying to rewrite its popular browser in Java.

Besides HotJava, there are no significant pure Java browsers. Fortunately, Netscape and Microsoft include a Java Virtual Machine (JVM) in their respective browsers, so their products can download and run Java applets.

The small one

Due out this month from Sun is the new Personal Applications Browser, which is aimed at handheld devices.

The browser was originally

built by Beduin Communications, which Sun bought in October.

Beduin also created two companion applications: an organizer, which includes a calendar, address book and memo pad; and an e-mail client, which connects to

Browser 1.1.5, the new browser will support HTML 3.2, but will also incorporate an array of new HTML tags developed by Netscape.

The current browser is capable of reading about 75% of documents from the Web, whereas the new one will read about 95%, Ryder says.

The new browser will also support Netscape's complete JavaScript, which can be thought of as a kind of shorthand used by programmers to control what happens on a Web page. Despite its name, the scripting language is unrelated to Java itself.

Finally, Ryder says that the user interface of the HotJava upgrade has been designed to be more like the most popular browsers. Users also will be able to change the browser's settings much more easily.

But Sun may have a tough job ahead convincing users that its Java browser technology will be the road to travel.

"I think we're fine with Netscape Navigator and Microsoft Internet Explorer," says Neil Fox, chief information officer of Management Recruiters International in Cleveland. ▣

New Java browsers from Sun

HotJava upgrade

- New name to be announced
- Shipping by June 1999
- For network computers, high-end consumer devices
- Uses the runtime in JDK 1.1.6 or better
- Basic Web browsing
- Highly customizable

Personal Applications Browser

- Acquired from Beduin Communications
- Shipping March 1999
- For cell phones, other handheld devices
- Runs on latest JavaOS for Consumers
- Supports HTML 3.2 and some HTML 4.0 extensions
- Requires 280K bytes ROM

Internet Message Access Protocol 4 and Post Office Protocol 3 mail servers. Sun will release these two products this summer.

The Personal Applications Browser runs on top of Sun's Personal JVM and takes up just 280K bytes of read-only memory, according to Karen Oliphant, Sun's product line manager for the new software.

The Beduin browser works with HTML 3.2 and supports some HTML 4.0 extensions. The browser needs a minimum of 600K bytes of RAM for a "fairly simple" HTML page and considerably more for pages loaded with graphics, Oliphant says.

The second browser, the upgrade of what used to be called HotJava, is due to be released by mid-1999, says Scott Ryder, Sun's Java browser product manager. The browser, which will get a new name, will work with any Java Development Kit from Version 1.1.6 onwards.

Like the current HotJava



Be a Net Know-It-All

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.

This week's question:

Document management company PC DOCS just agreed to be purchased by Hummingbird Communications. What company made an unsolicited bid to buy PC DOCS late last year?

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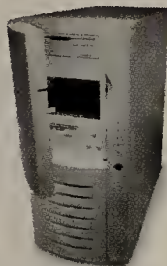
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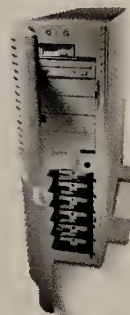
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Hewlett-Packard reorg, take two

New unit gives direction to HP's e-commerce act.

BY ELLEN MESSMER

PALO ALTO — Two weeks ago, Hewlett-Packard split in two. Last week, the larger half, which hung onto the name and the computer and network businesses, formed a new Internet Business Unit (IBU) that is aiming for a place in the electronic commerce sun.

The 4,000-person IBU is not exactly brand-new — it was formed by shuffling the cards in HP's old Internet software business unit.

The IBU, headed by Joe Beyers, has five divisions, one of which pulls together HP's scattered security-product efforts into an Internet Security group.

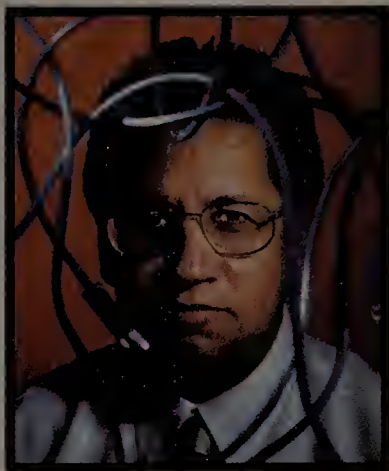
This division will develop new products and integrate the best existing products it can find from outside vendors into HP offerings, says Roberto Medrano, Internet Security group's general manager.

These offerings in turn will be sold by at least one of the newly formed e-commerce divisions.

Groupings

These e-commerce groups are: E-Business Solutions, headed by Ron Eckhardt, which provides e-commerce offerings for vertical industries, including banking, manufacturing and business-to-business trading; the E-Services Division, headed by Nigel Ball, which will provide business software; a separate VeriFone payment-processing division, headed by Ken Wack as acting general manager; and the E-Commerce Division, headed by Joe Beyers as acting manager, which will focus on software for customer relations.

HP lost no time in advertising its e-commerce initiative, launching a \$150 million ad campaign aimed at convincing network executives that HP means e-commerce.



Medrano will lend direction to HP's security-products efforts as general manager of the new Internet Security group.

The first blitz came in the form of a four-page advertising spread that HP placed in the *Wall Street Journal* last Tuesday.

Unfortunately, it was hard to understand the point HP was trying to make with the artsy photo of a gas station in a desert with a car, accompanied by the explanation that an electronic chip in the car was notifying the manufacturer about a gasket problem.

Catching the wave

HP says it's trying to say that "e-services are the next wave of the Internet" and that HP is going to lead it.

But some analysts are skeptical of HP's potential in e-commerce.

"HP missed the first wave," says Tom Henkel, Gartner Group senior analyst. He says that HP has little visibility in Web design, Web tools or Java.

Despite its missteps, Henkel thinks HP has the potential to make an impact in e-commerce.

And for some companies, HP already clearly has. For Liz Claiborne in New York, for example, HP set up a "virtual showroom" called @Market that lets retailers view and zoom in on Liz Claiborne garments while planning their orders. ■

Analyzers, continued from page 1

product strategy in coming weeks.

The products will come on the heels of Network Instruments' announcement last week of Version 6.0 of its Windows-based Observer protocol analyzer, which has been updated to gather data from specific switch ports and to collect statistics from an entire switch.

"One of the more difficult things to diagnose is a switch," says Rick Nelson, president of the Palatine, Ill., Network Diagnostic Clinic, which remotely monitors networks for libraries and schools. He is looking forward to using Observer to count errors and to catch problems that might occur over time through a switch.

No buzz

Although there's not much industry buzz about them today, protocol analyzers have long been a staple of network managers' tool kits, helping net managers zero in on trouble spots. But analyzers were originally designed for shared networks, picking up and examining all traffic as it is broadcast across a shared wire.

LAN switches break shared networks into segments, and traffic is only broadcast over a particular segment. This is a benefit of switches because it cuts down on the overall noise and devotes more bandwidth to each endstation.

A protocol analyzer, however, can usually hear traffic only on the segment to which it's connected, so it can't get the total picture of what's happening through the switch. If there is only one endstation on a segment, such as on a desktop switch, the analyzer can see even less. Finding which endstations are wreaking havoc on the network, or pinpointing congestion problems, is more difficult.

In the past, vendors have recommended that during a test users set their switches to promiscuous mode, which sends all Ethernet frames to all

ports on the switch. This way, the analyzer can see all traffic. But this isn't a measurement of real-world switch conditions, and the benefit of the switch is eliminated if such a test is prolonged. AG Group, which makes the EtherPeek protocol analyzer, still recommends this approach.

Another technique is port mirroring, which copies traffic going through one port to a port where a protocol analyzer resides. But this approach limits the analyzer's view to one segment at a time.

Sniff this

Network Associates of Santa Clara, Calif., is preparing a slew of product improvements to deal with switches. The improvements will be made in the company's portable hardware/software Sniffer analyzer that plugs into a network, and its Distributed Sniffer, which

is reached, Sniffer will be able to take the traffic going through that port, mirror it to the port with the analyzer on it and alert a help desk.

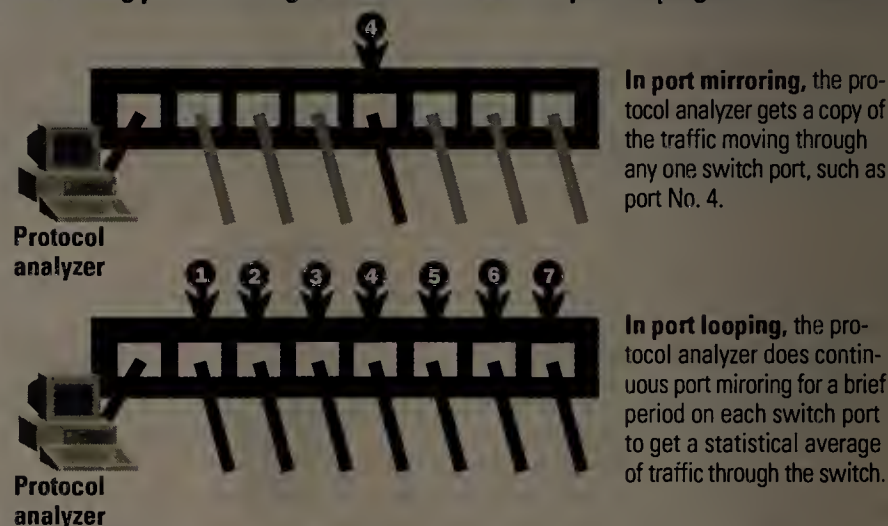
Separately, Network Instruments has released a version of its PC-based Observer product that uses a technique it calls "port looping" to gather statistics through an entire switch. The product uses port mirroring to look at each port on the switch for only a short time.

By sampling traffic through each port, one at a time, Observer can build statistics about traffic through the switch that are fairly accurate, says Douglas Smith, president of the Minneapolis firm. Network Associates' version of port looping is called "port roving" and will be in a new release of Distributed Sniffer available by year-end.

Network Associates, however, will extend the concept to VLANs and will allow network

Throwing analyzers for a loop

Emerging protocol analyzers can work with switches to get detailed traffic data using port mirroring or statistical data from port looping.



uses servers throughout a network to report back to a central software-based console.

The company soon will unveil Versions 2.5 of its portable and distributed Sniffer protocol analyzers, which discover VLAN configurations in a switch and detect problems in the configuration. These capabilities are specific to certain switches, however. The new versions will support products in the Cisco Catalyst 5000, 5500 and 2900 series. Network Associates expects versions due out later this year to support Nortel Networks and 3Com gear.

Distributed Sniffer 3.0, due out by the end of June, will let network managers set thresholds for traffic levels through a switch port. When a threshold

managers to select which VLANs or ports from which they want to collect data.

In the second half of this year, Network Associates will release Desktop Sniffer, which lets managers get another perspective on desktops connected to switches and extends the Sniffer product set's reach into application management. The software resides on users' desktops, captures packets there and works with Distributed Sniffer to give network managers information about problems users are encountering when trying to access data or log on to the network. ■

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NDS,
continued from page 1

many IT shops as they can before Microsoft gets its Windows 2000 Active Directory out the door. But how far is Novell willing to go?

In one camp are CEO Eric Schmidt and top strategy man Chris Stone, who want to give the product away. In the other are the board of directors, conservative-minded marketing vice president John Slitz and sales head Ron Heinz, who all want to hang onto the NDS for NT revenue stream.

Users are split.

"Free NDS for NT would be a brilliant move," says Larry Bradley, an IT manager with the Georgetown University business school in Washington, D.C.

IT budgets are being consumed with Y2K remedies, so there isn't a lot of money available for new products. If Novell makes NDS for NT free, it "would allow more shops that have a mix of network operating systems to quit asking the NetWare or NT question," Bradley says.

But even a free directory wouldn't sway Ed Bianco, chief information officer at

Lowell General Hospital in Lowell, Mass., to deploy NDS for NT on his 20-server NT 4.0 network. Bianco tested NDS for NT, but he decided it was not worth the effort.

"Why would I roll out one directory for a year or two and replace it with the one I want?" Bianco says. "I've got to roll out Windows 2000 anyway, so I might as well do the directory then and go through the pain only once."

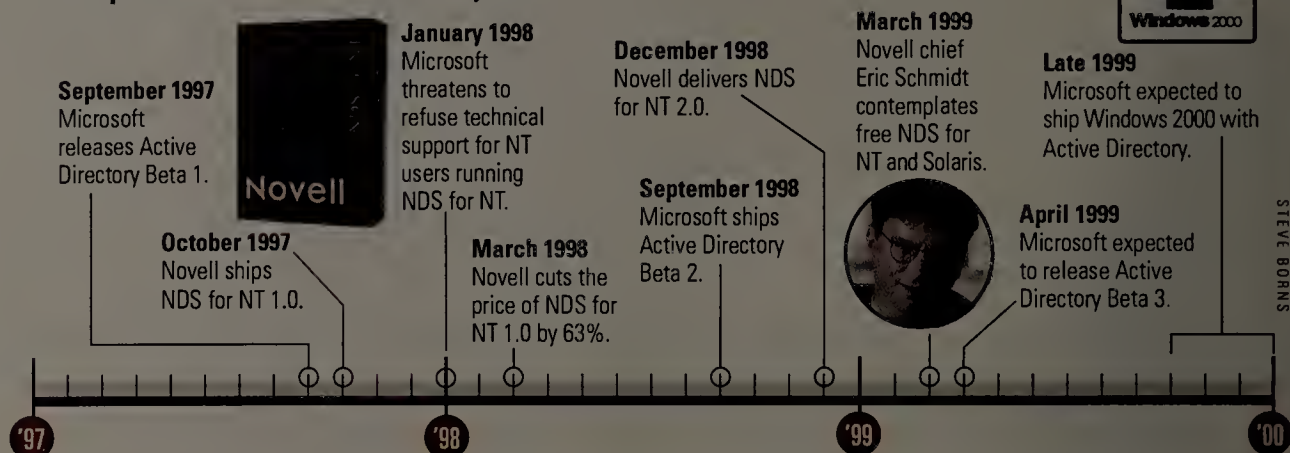
One California systems integrator who deals with Novell and Microsoft products warns that deploying NDS for NT can make irreparable changes to NT security files. Those changes would make an eventual migration to Active Directory more difficult. "So while free NDS for NT could be a nice carrot, there are other [reasons why] users are holding off on it," he says.

Stephen Bacon, an engineer with the integration firm NetConnect in Cambridge, England, agrees.

"While NDS for NT might reduce administration costs, the risk of increased operating system support costs are quite real," he says. "And neither company is really bending over backwards with support help

The directory service volley between Novell and Microsoft

Even though Microsoft's Active Directory hasn't shipped yet, Novell has been forced to compete with it for more than two years.



when there is an issue using both products."

The argument for freeware

The free NDS for NT faction is confident that the 6-year-old NDS is easier to deploy and use than the fledgling Active Directory will be when it ships toward year-end. The group contends that if Novell can get NT-only shops to give the product a try, they'll like it. Then maybe the shops will opt out of the anticipated migration hassles of moving to Active Directory.

Now in its second iteration, NDS for NT sits on top of

Windows NT 4.0 servers and gives administrators the ability to centrally manage access to them via NDS. Because NDS also runs on NetWare, Sun's Solaris, Linux and IBM S/390 boxes, an administrator can centrally control access to all of the boxes using a single set of directory tools.

Novell has had some success selling NDS for NT to its traditional NetWare customers who have had to deploy NT as application servers or branch-office servers, explains Todd Chipman, an analyst with Giga Information Group in Santa Clara, Calif. However, the company has had almost no penetration into sites where NT is the primary network operating system, Chipman says.

Currently, Novell charges \$695 per replicated NT Server box plus \$26 per end-user connection.

But internal opponents to the freeware plan worry about what effect the move might have on Novell's bottom line.

After dropping to an all-time low of \$6 per share in April 1997, Novell has made a slow, steady climb back to Wall Street respectability.

Novell stock topped off at \$24 last week, immediately following an announcement that the company was releasing beta code for a new, highly scalable version of its directory called NDS Version 8. The turnaround is largely credited to Novell's focused directory message and its efforts to build new products that tap into NDS (see story, this page).

Analysts who attended an NDS briefing earlier this month say top strategy man Stone characterized NDS for NT pricing as a "subject of intense debate" among his colleagues. Stone declined to comment for

this article.

Novell's Michael Simpson, director of product marketing, says product pricing is reviewed routinely. For example, Novell cut the original price of NDS for NT 1.0 by more than 60% last March after customers complained it was too expensive. Additionally, Novell extended its free upgrade promotion for NDS for NT 2.0 until the end of April for users who have previously purchased the first version.

However, the decision to give away NDS for NT has yet to be made, Simpson says.

Novell has promised an update to NDS for NT 2.0 later this spring with a new version that runs on a pure IP network. Additionally, Novell will ship a version of the product later this year that will be based on NDS Version 8, Simpson says.

Either release date would be a logical time for Novell to change the NDS for NT pricing scheme. The sooner the better, analysts say.

"They should be out there seeding the market with this stuff as fast as possible," says Bob Sakakeeny, an analyst with Aberdeen Group, a consultancy in Boston. Directories are not like browsers because companies don't deploy directories and then swap them out easily, he adds. "If Novell gets people invested in NDS, they are likely to stick with that at Active Directory's expense," Sakakeeny says.

"[Novell executives have] got to decide whether they are going to take a short-term hit in revenue in order to ensure their long-term success," Giga's Chipman says.

Other analyst noted that Novell could easily cover any revenue shortfall with the billion dollars it has in the bank. ■

NOVELL TO DEBUT MGMT. TOOLS

Novell next week is expected to take the lid off a new suite of tools for performing policy-based management of desktops, servers, routers and switches in NetWare environments.

All the modules in the company's new K2 management suite can tap into Novell Directory Services and be administered via Novell's Java-based management console, ConsoleOne. Administrators can use the tools to define network access policies across an enterprise.

Novell, which sources say will unveil K2 at its fifteenth-annual BrainShare user conference in Salt Lake City, declined to comment on the software. But analysts briefed on K2 say it consists of new versions of existing products, such as ManageWise, ZENworks and NWAdmin, as well as new software for managing routers and switches.

Novell is hoping the K2 suite will be as successful as its ZENworks directory-enabled desktop management package has been in the 10 months it has been on the market.

K2 will extend ZENworks' features to servers, allowing companies to automate and standardize initial server configuration. In addition, K2 will allow administrators to set policies for distributing software to individuals

or groups of servers. It's unclear whether this package will manage NT or Unix servers.

Users say they could use more help managing their NetWare servers.

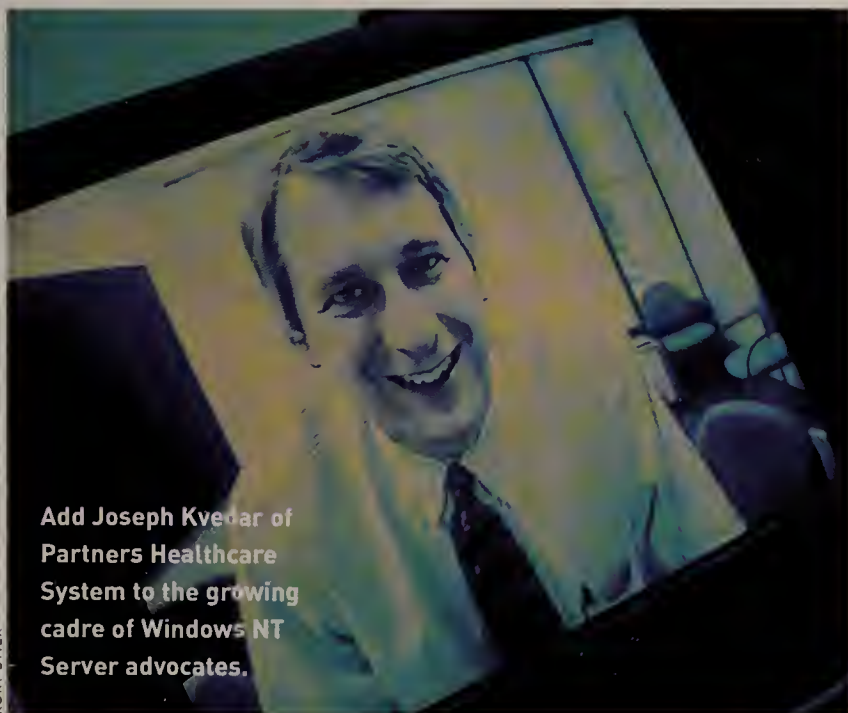
"We never seem to be able to stay on top of keeping all the servers in optimal condition with all the right software patches, drivers, etc.," says Bill Kannberg, IS manager for Hillsboro County in Florida. "I'd like a product that could analyze, configure and help manage servers in the field."

Novell will also be announcing a new version of ZENworks with improved software distribution capabilities, sources say. While the current version lets an administrator push software out to groups of users based on their operating system or hardware configurations, the new version will allow an administrator to push software to selected desktops based on what is contained in the desktop registry files. This revision also supports "lights out" software distribution that lets an administrator install programs on desktops without end-user participation. Version 2.0 also has the ability to track software inventory across the desktops.

ZENworks 2.0 is in beta now. Officials would not comment on a delivery date.

— Christine Burns

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ARE YOU GETTING WHAT YOU **NEED** FROM YOUR NETWORK OPERATING SYSTEM?

Productivity soars when an OS goes beyond the basics and includes the full range of networking services

Snapper Inc., a midsize manufacturer that produces 120 different lawn products from its plant in McDonough, Ga., knows IT operating systems. It has experience with the IBM AS/400s, Novell NetWare, and Microsoft® Windows NT® Server. But when it came time to determine a platform for a critical sales force automation application that needed to integrate with a wide range of back-end systems, the company chose Windows NT Server without hesitation. "Applications are cheaper and faster to develop and easier to run in the Windows NT world," explains Howard Jones, Snapper Inc.



▶▶ "Applications are cheaper and faster to develop and easier to run in the Windows NT world," says Howard Jones, Snapper Inc. vice president and CIO.

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vice president and CIO.

A year ago Adaptec Inc. found itself wrestling with too many network servers. At its Milpitas, Calif., headquarters alone, it had over 75 NetWare servers providing file and print services as well as basic application and database services. Each NetWare-based application required its own server due to reliability issues, and the number of support administrators kept growing. By switching to Windows NT Server 4.0, Adaptec can run multiple applications and databases on

connected to the LAN. They want to use rich, new types of information, such as IP-based telephony and audio and video. And, they want to leverage existing systems to provide strategic advantages. At the same time, they want to ensure a smooth migration to a more open, flexible infrastructure—one where servers can be re-purposed as needed. And IT, business managers insist, must provide it all in a way that ensures security and reliability.

At the same time, global com-

tem, such as Microsoft Windows NT Server. Multi-purpose operating systems incorporate a range of functionality: file and print serving, application services, Web services, communications, and more, observes Jean Bozman, software analyst, International Data Corp. (IDC), Framingham, Mass. But the value goes beyond functionality; multi-purpose operating systems like Windows NT Server also integrate the functionality with a set of management tools and services and a common directory that en-

sures that the result is far greater than the sum of the parts.

In response, IT managers at midsize companies are looking to consolidate and

standardize. "You want to have uniform, consistent capabilities, which is how you can control cost of ownership," advises Brian Connelly, CEO, Enterprise Communication Messaging Solutions (ECMS), Inc., Columbia, S.C., the systems consultant that developed the Snapper sales force automation solution. With uniform, consistent behavior across all systems, applications can be built faster and cheaper, fewer administrators are required, and training is reduced. You also achieve easier, more complete interoperability.

By switching to Windows NT Server, for example, Adaptec not only was able to reduce the number of administrators by about 30%, but each administrator "could do much more than administer a server," Fernandes explains. Because the operations are GUI-based, administration is easy and consistent across services, which allows Adaptec's server administrators to also handle the databases and the applications.

→ Continued on page 8

"There is no question that reducing the number of operating systems can lower costs." -Jamie Lewis, president, Burton Group

the same server platform and consolidate its file and print services without compromising reliable file and print, reports Ryan Fernandes, Adaptec network operation manager.

As Adaptec and Snapper have discovered, in today's complex and high-pressure IT environments, anything easier, faster, and less expensive will be welcomed. Where one technology can do the job of two or three, and do it as well or better, it is sure to be embraced by IT groups, especially midsize ones that may lack specialized resources.

THE BIG SQUEEZE

Organizations today find themselves increasingly squeezed. Business users are demanding more IT services and capabilities. They want reliable and fast file and print sharing, as usual, but they also want email and messaging. They want rich standards-based intranet solutions and database applications that are as easily accessible by remote users as by employees

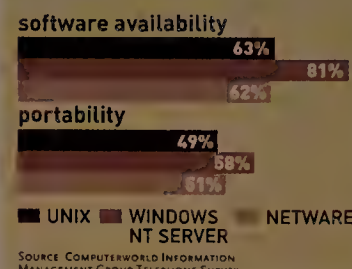
petition is forcing organizations to cut costs. The IT group is under the gun to do more with less, and reduce the cost of ownership. Midsize organizations, for example, no longer can maintain multiple IT platforms and train different sets of administrators. As a result, every aspect of the IT function is open to question: training, the number of administrators, the mix of vendors and platforms, and more.

DOING MORE

Key to controlling costs while delivering the enhanced IT services is the multi-purpose operating sys-

WINDOWS NT COMES UP STRONG

Below are percentages of IT managers who said their OS platform rated good or very good in these criteria.



YEAR OF THE RAS-VPN

Windows NT Server delivers open communication

To work effectively, people need to communicate and access information easily and efficiently. With the advent of the Internet and e-commerce, organizations need open, flexible, interoperable solutions — not the proprietary point solutions of the past.

Today, open systems — server-based systems that allow organizations to pick and choose among a wide choice of diverse yet interoperable hardware and software products — are enabling companies to change the way they build and manage voice and data networks. Citing a second generation of products and falling prices, IDC projects the RAS (remote access services) market to exceed \$700 million, reflecting a 51 percent CAGR since 1998.

Windows NT Server is the open systems platform for a new generation of simpler, more affordable communications. Organizations today dramatically reduce costs, and increase productivity, by connecting telecommuters, mobile employees, satellite offices, and extranet partners with Windows NT. Windows NT Routing and Remote Access Service and VPN (virtual private network) capabilities facilitate remote access management. Using the Internet and direct private-line connections, Windows customers can easily deploy integrated networking solutions that optimize their application and security needs in the most efficient way possible. According to Infonetics Research, San Jose, Calif., the number one remote access strategy for companies is to deploy a combination VPN/direct-dial service.

Windows NT Server is also helping to dramatically reduce remote access deployment costs with the Connection Manager Administration Kit (available in the Windows NT Option Pack). Using this tool, organizations can centrally configure and deploy single sign-on remote access clients for direct-dial and VPN. Windows NT Server's centrally managed phonebooks ensure these clients can easily access up-to-date local RAS or VPN dial-up phone numbers to make least-cost connections. "By building in and integrating secure VPN, routing, and direct-dial services, we make connecting users and offices easy and safe to use," explains Microsoft's Mike Nash.

Windows NT Server, IDC reports, currently can



support hundreds of simultaneous RAS users and Windows load balancing services, and embedded solutions promise even more scalable VPN services. Windows 2000, IDC adds, will handle significantly more simultaneous RAS users.

HIGH-TECH HOTEL Organizations of all sizes are capitalizing on the integrated communications services of Windows NT Server and innovative network-aware applications. For example, using a Windows NT-based solution, the San Jose Hyatt hotel was able to extend to its high-tech clientele fast, easy, and secure high-speed access to the Internet so they can be more productive while on the road.

The hotel's primary business customer is laptop equipped and travels frequently to Silicon Valley. Through Windows NT Server and San Diego-based ATCOM/INFO's IPORT secure, reliable, public Internet access solution, the hotel is able to provide information and high-speed Internet connectivity in more than 250 of its rooms. The service makes available high-speed Internet links for guests to use to connect to their company networks with Windows VPN services. "Since we turned it on last April, we've experienced steadily increasing usage," reports Jeffrey Burg, executive assistant manager. Now the hotel is looking at more integrated application services it can provide to better service its high-tech clientele with Windows NT Server.

COMPAQ AND MICROSOFT: BETTER PARTNERSHIPS= BETTER SOLUTIONS= BETTER ANSWERS FOR CUSTOMERS

CIOs and IT managers today are faced with some pretty tough questions:

- ▶ "How do I demonstrate IT business value?"
- ▶ "How do I ensure secure network access from anywhere, anytime?"
- ▶ "How do I create a flexible, scaleable IT infrastructure?"
- ▶ "How do I manage my heterogeneous network?"

Many organizations have already selected Windows NT Server to meet their computing needs. With any server deployment comes risk – risks of mis-planning for a growing business' needs, risks of inefficient deployments, and risks of complex and costly operations. How does IT management minimize these risks? Wise choices.

WHAT'S HARDWARE GOT TO DO WITH IT?

Does hardware make a difference in deploying Windows NT servers? You bet it does. Deploying a scaleable and highly available Server requires a reliable, standards-based hardware platform that helps customers to achieve and sustain competitive advantage, achieve quicker return on their server investment as well as reduce complexity and costs in their IT environment.

Not every hardware vendor is equipped to deliver the kind of performance. Compaq's long-standing partnership and history with Microsoft ensures that both, the server software and hardware are stress-tested, co-engineered and fully optimized for highest performance and reliability. Compaq ProLiant represents the most stable computing environment for running Windows NT based Networking and Application Servers.

There are four main factors that make Compaq ProLiant the platform of choice for Windows NT Server deployments: Fruits of the Frontline Partnership, Shared Commitment to Reducing Complexity, Engineering Excellence and Value-Added Services.

THE PROOF IS IN THE PARTNERSHIP

Compaq's close alliance with Microsoft strengthens its ability to support Windows NT Server deployments

with minimum risk and maximum cost effectiveness. Compaq has more hands-on, real-world experience with

Windows NT Server than anyone else in the industry. In the past 4 years, Compaq has helped over 3 million users migrate from a multitude of environments to Windows NT. In fact, Microsoft recently named Compaq the first worldwide Prime Integrator for Windows NT.

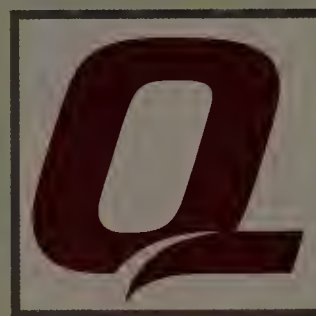
Compaq has fostered a close relationship with Microsoft for over 15 years

– dating back to 1983, formalized as the Frontline Partnership in 1993. This partnership has provided customers a superior Windows NT server platform that is simple to install, easy to use, and provides excellent value and performance.

The simple reason that the Compaq/Microsoft combination has won over so many customers is that it simply works better and more reliable than competitive solutions. From simplifying installation, to being able to accurately configure the solution, to operating with peak performance, Compaq ProLiant/Windows NT-based solutions make IT management's task easier, the customer's business more productive – and ultimately, through increased uptime and decreased costs of ownership – more profitable.

COMMITMENT TO SIMPLIFICATION

Compaq and Microsoft alike recognize that deploying enterprise-class networks and applications is often a complex, time and resource-straining task for customers. With a co-commitment to simplifying the planning, deployment, and operation of Windows NT-based networks and solutions, Compaq provides expertise and smart tools that enable customers to re-



duce complexity, save time and resources over the life of the server and continues to deliver customer-driven innovations that address key challenges in the IT environment.

Compaq ActiveAnswers for example is the industry's leading online destination for enterprise computing solutions and services. ActiveAnswers serves as a information hub for resellers, VARs, solutions integrators, consultants, ISPs, Web developers and self-integrating companies to gain

access to over 40 jointly developed and fully tested solution areas.

Microsoft is one of Compaq's premier ISV partners participating in the co-development of ActiveAnswers. Today, users can gain access to ActiveAnswers for Microsoft Windows NT Server 4.0, where they will find proven methods and best practices for developing and deploying Windows NT 4.0 based networking platforms, as well as ActiveAnswers for various Microsoft Solutions like MicrosoftExchange, Microsoft Site Server, and Microsoft Internet Information Server.

ENGINEERING EXCELLENCE

Compaq and Microsoft engage in many co-engineering and testing efforts including benchmarking, architecture development, and developing lifecycle enhancers.

The Compaq ProLiant family of servers has made headlines for its technological innovations with Fibre Channel, HotPlug PCI, its SmartStart installation tools and

available sizing and configuration tools for Windows NT Server based solutions. Combining Compaq ProLiant with Windows NT delivers customers the most optimized platform for networking infrastructure as well as application server deployments.

ENHANCING SOLUTIONS WITH SERVICES

One of the crown jewels of Compaq today is its Services Organization. Its portfolio of customer-proven services features Windows NT-related offerings including: Enterprise Windows NT Services, Microsoft

"Compaq and Microsoft work together at a fundamental level to provide the highest possible levels of integration, reliability and performance. The Frontline Partnership works for our customers."

—Eckhard Pfeiffer, President and CEO, Compaq Corporation

Exchange Services, Internet/Intranet Services, Financial Services Industry Solutions, Intelligent Network Service Solutions, Lifecycle Services, Support Services for Windows NT and High Availability Services.

Compaq Services boasts more Microsoft Certified Solution Developers (MCSDs) and Microsoft Certified Solution Engineers (MCSEs) than any other vendor combined. MCSE and MCSD represent the highest certification level for Microsoft technologies, and Compaq currently has over 2,200 professionals certified at this level and will add 1,000 more by the end of 1999.

WHAT'S NEXT FOR THE COMPAQ WINDOWS NT SERVER PLATFORM?

1999 presents a unique balancing-act challenge for CIOs and IT managers – as they address questions about network management, scalability, reliability, and reducing TCO, they also face the additional question of "Will our organization be Y2K resilient?" After the Y2K milestone comes and goes, attention will refocus on creating the web-enabled enterprise. As the demand for multi-dimensional and inter-connected supply chains increases, enterprise customers will turn more and more to the Internet extending their networks into "business ecosystems." The flexibility and robust nature of Windows NT provides the digital nervous system for bringing these ecosystems to life. Together as business partners, Compaq and Microsoft will

COMPAQ

continue to work to make these ecosystems interoperable, secure, manageable – and affordable. That's what the Compaq and Microsoft partnership is all about – delivering best of class enterprise solutions to customers worldwide.

THE COMPAQ AND WINDOWS NT SERVER 4.0 ADVANTAGE:

<http://www.compaq.com/partners/microsoft/products/nt4desc.html>

COMPAQ ACTIVEANSWERS FOR NT SERVER 4.0:

http://www.compaq.com/activeanswers/about/info_winnt.html

COMPAQ/MICROSOFT FRONTLINE PARTNERSHIP:

<http://www.compaq.com/partners/microsoft/about/index.html>

COMPAQ PROLIANT SERVER INFORMATION:

<http://www.compaq.com/products/servers/>

DID YOU KNOW?

- Compaq commands the clear lead in the NT server market with more than twice the volume of the nearest competitor...
- Compaq and Microsoft were the first vendors to break the \$20/tpmC barrier with the most recent ProLiant 7000 / Windows NT 4.0 TPC-C benchmark.1
- In the past four years, Compaq helped over 3-million users to migrate from other NOS environments to Windows NT...
- Compaq has nearly 4 million seats of Microsoft Exchange under deployment contract

← Continued from page 4

"We are getting more bang from our administrators," he reports.

In the past, IT has turned to specialized operating systems to perform different functions. This came about because of the limitations of the technology at the time, particularly PCs. "A PC with a 386 processor simply couldn't run big databases or applications, which is a key requirement for serious business servers," explains Mike Nash,

operability and efficient, effective administration and management.

WINDOWS NT SERVER DELIVERS BENEFITS

As its term implies, the multi-purpose operating system includes a range of capabilities. Ideally, the multi-purpose OS will allow the organization to easily enable or disable particular functionality as dictated by the organization's situation, explains Jamie Lewis, pres-

cess services.

► Integrates advanced features such as virtual private networking and streaming media.

► Provides efficient management and administration, with enhanced hierarchical directory support coming shortly.

► Offers a robust, tightly integrated security model that delivers complete security through a single, efficient security process.

► And all of these features come wrapped with an integrated set of services that enable organizations to efficiently administer their open, distributed systems environment.

"Windows NT is already a requirement for success among virtually all industry vendors." - International Data Corp.

director, Windows® Server and Infrastructure Product Marketing Group at Microsoft. Organizations that needed sophisticated application or database serving were forced to buy RISC-based hardware running Unix and operate it alongside their PCs.

Suddenly organizations were running three or more operating systems and deploying dedicated proprietary point solutions. This created headaches for the IT group, requiring them to hire and train administrators for each OS, and to try to forge some level of interoperability between platforms.

"In the 1980s it was all we could do to knit PCs together. In the 1990s, we want better interoperability. We also want more capabilities, including integrated Internet," IDC's Bozerian notes, explaining the evolution from network operating systems that simply allowed organizations to tie together PCs to today's multi-purpose operating systems that integrate a wide range of functionality. Moving forward, organizations will not only want that range of functionality but seamless inter-

operability and efficient, effective administration and management.

Windows NT Server offers the kind of multi-purpose capabilities once associated with more costly and often proprietary platforms. Highly modular, Windows NT Server enables midsize organizations to pick and choose functionality and add new functionality as needed. Specifically, Windows NT Server:

► Provides fast and reliable file and print.

► Handles sophisticated applications and complex relational databases.

► Offers Web application services, as well as advanced communications with integrated remote ac-

cess services. Ultimately, the payoff from the multi-purpose operating system is more effective computing. "There is no question that reducing the number of operating systems can lower costs," says Lewis.

The lower costs are achieved through savings that result from the simplified, consolidated computing environment due to advanced, tightly integrated functionality and consistent security. This allows IT groups to redirect administrators toward higher value work. Adaptec, for example, cut more than 30 servers as well as re-deployed its administrative staff. Particularly for smaller and mid-size companies, Lewis concludes, "the multi-purpose operating system will become more important."

Over the past several years,

WINDOWS NT GAINS ON UNIX, NETWARE

Percent of business applications supported by each operating system today and two years from now (base of 201 respondents)

applications	today	2 years	% of change
UNIX (141 responses)	30.0%	31.0%	+3.6%
NT SERVER (180 responses)	31.6%	44.1%	+39.3%
NETWARE (141 responses)	27.7%	17.6%	-36.6%
Other	10.9%	7.4%	-32.4%

SOURCE: COMPUTERWORLD INFORMATION MANAGEMENT GROUP TELEPHONE SURVEY

WIRED MEDICINE

Windows NT streaming media helps with healthcare training

Streaming media—rich, synchronized audio, video, and Web pages—plays an increasingly important role in organizations. Many companies are turning to streaming media over the network to reduce training costs by eliminating the need for workers to travel to training sessions. At the same time, it can provide a better training experience to more people.

Windows Media Services in Windows NT Server, for example, allows Partners Healthcare System, Boston, to literally put its medical expertise on the Web. The health organization, closely affiliated with the world-renowned Massachusetts General Hospital, is committed to educating physicians and healthcare professionals. Having already standardized on Windows NT Server, the organization had no trouble adding audio/video to its educational offerings, reports Joseph Kvedar, director of telemedicine.

"In the past, we brought people into an auditorium. Now they can access the same thing through a Web site using their browser and the Windows Media Player," Kvedar explains. Though it's not quite the same, he adds; it's better. Through the Web site viewers can simultaneously access supplemental information, such as PowerPoint® slides. The result is a richer experience for users. At the same time, Partners is able to reach a broader audience while saving time and money.

▶▶▶ Windows Media Services allowed Partners Healthcare System to easily add audio/video to its educational offerings, says Joseph Kvedar, director of telemedicine

Microsoft has shaped Windows NT Server into a leading multi-purpose operating system. IDC concludes: Windows NT will lead the OS market. This growth, IDC notes, will come at the expense of Unix and other operating systems.

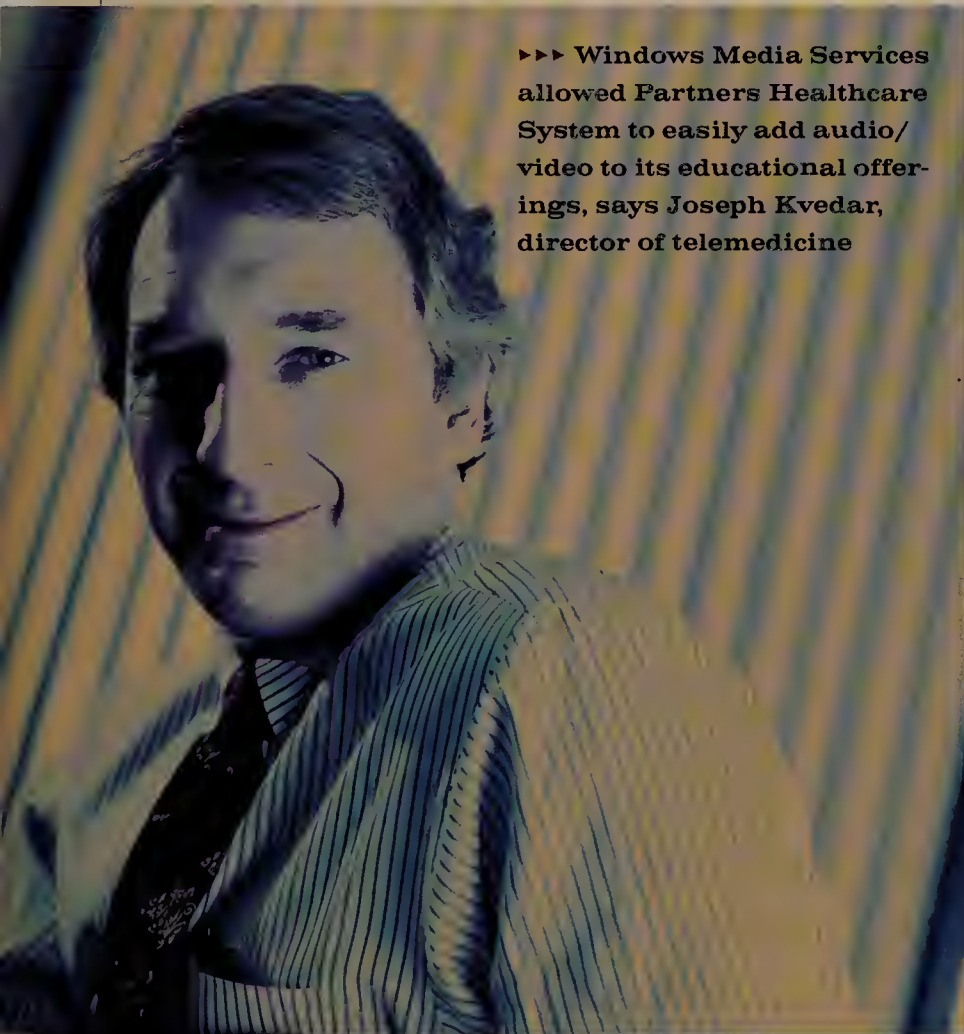
PROOF IN PERFORMANCE

Market acceptance can be attributed, in part, to performance. In testing by Mindcraft Inc., Los Gatos, Calif., an independent test lab, Windows NT Server as a file server performed 25.5% faster than NetWare 5 when configured with out-of-the-box settings that customers can actually apply in real world environments. When performance is correlated to cost, Mindcraft found that Windows NT Server 4.0 provides 2.7 times better performance for the price (www.mindcraft.com/whitepapers/nts4nw5filesvr.html). In Web performance tests Mindcraft found Windows NT Server 4.0 to be four times faster than Solaris 2.6 with its Web server and it offers 10.3 times better price/performance (www.mindcraft.com/whitepapers/nts4sol26web.html).

Windows NT Server also enjoys widespread industry support from thousands of hardware vendors, independent software vendors, and support services companies. "There are over 200,000 professionals trained on Windows NT, more than with any other platform," says Microsoft's Nash.

Windows NT Server 4.0 clearly delivers. "The application we built for Snapper could not be built on NetWare," Connelly insists. The application for Windows NT was quicker to build and used less hardware than would be the case with other operating systems, and it is also more scalable and easier to administer, he adds.

→ Continued on page 12



KURT STIER

SERVING UP APPLICATIONS

Windows NT Server takes business to the Web

At the heart of every business are applications that allow the organization to take orders, buy inventory, deliver goods and services, and perform a host of other activities.

An application server is a group of software services that support the creation of robust, scalable server applications, which are accessible from browser and non-browser clients.

Windows NT Server is widely accepted as a leading application server. Thousands of independent software vendors target their applications for the Windows NT platform. These vendors are taking advantage of the rich application services provided by features such as Microsoft Transaction Server (MTS) and Microsoft Message Queuing Services (MSMQ) in building n-tier distributed applications.

For example, MTS provides the services a Windows NT application needs to be distributed, secure, and transactional. With an easy-to-use programming model, MTS makes these application services available to mainstream developers, allowing them to spend more time on business problems.

As an application server, Windows NT Server enables the rapid development of applications. It provides a robust, secure transaction environment able to handle business-critical applications and offers messaging and queuing for interoperability. In the process, it delivers efficient database pooling and load balancing, ensuring that the organization gets maximum performance from its systems. All of this technology is unified by a single component model, making it easier to integrate and evolve applications. By capitalizing on the power of component-based application services, organizations can take their existing products and re-deploy them on the Web as Windows DNA (the Microsoft n-tier architecture) solutions easily by leveraging the application services in Windows NT Server.

BUILT FOR THE WEB With Web connectivity built directly in Windows NT Server, organizations can position themselves to tap into a rich and growing e-commerce environment. The integrated application services provided by Internet Information Server (IIS) in Windows NT lets organizations use

the Internet to share information or provide rich Web-based application services.

For example, 1-800-Flowers Inc., Westbury, N.Y., a direct marketer of flowers and e-commerce pioneer, initially built its Web commerce system in-house. "When application services like MTS and IIS became available, we liked what they had to offer. We have been able to build an enterprise class Web



site by leveraging the strengths of the Windows NT Server," recalls Donna Iucolano, vice president, interactive services.

The 1-800-Flowers Web site is built on top of the application services found in Windows NT Server and integrates with the back-end order processing and fulfillment systems, which are built on an Oracle database and run on the Unix platform. The company runs a mix of Windows NT and Unix servers. Says Iucolano, "Windows NT is a powerful platform for developing distributed applications. Our programmers can focus on the business tasks at hand because they have a seamless development environment based on the integration of Windows NT Server, the application services, and the development tools." Windows NT Server also provides a very scalable environment. "Our business is seasonal and Windows NT is also easy to scale up for peak times," Iucolano explains.

Similarly, barnesandnoble.com, the Web commerce arm of Barnes and Noble, adopted Windows NT Server for its platform and systems infrastructure when it launched its online business in 1997. The giant bookseller chose Windows NT Server 4.0 for its scalability and flexibility, notes Ben Boyd, vice president, communications.

Windows NT Server has proven itself. Barnesandnoble.com experiences 19 million page views on average each week. It has been cited as the third-largest e-commerce site. "Windows NT Server and its application services are the infrastructure that will take us into the future," Boyd concludes.

Although not every business is as engaged in Web commerce as 1-800-Flowers and barnesandnoble.com, the same application services that make Windows NT Server ideal for Web business also make it effective for intranet and extranet applications.

barnesandnoble.com



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- Deploying and supporting Small Business Server 4.5

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Where do you want to go today?

STICKING TO THE BASICS

Windows NT Server stays true to its core

While it is the advanced features of Windows NT Server that grab attention, the multi-purpose operating system continues to deliver efficient core networking services such as very fast and reliable file and print. The Windows NT Server file system (NTFS) is a highly scalable, easy to manage, secure file system for sharing files across an organization, regardless of the desktop system. Windows NT Server supports MS-DOS® and all 16-bit and 32-bit Windows-based clients, as well as Unix and Macintosh clients. It also works with other servers that may be on the network, such as NetWare and Unix.

Strong security is another core capability. "Windows NT Server offers the most robust and flexible security model of any general-purpose server or workstation operating system on the market today," asserts Microsoft's Nash. It includes such features as trusted-path logon and the Security Reference Monitor, which establishes a single place within the operating system for resource authorization services. This ensures that customers can lock-down their environment as they see fit.

Windows NT security, however, is flexible. Windows NT Server can be configured to favor user convenience over security, or to provide the high security that is often required by government agencies.

Windows NT Server also provides a core set of built-in services that form the foundation of basic management. Administrators can balance both centralized and decentralized control, ensure service availability and quality of service, and minimize cost of ownership. Windows 2000 Server will enhance

▶▶▶ **Adaptec's Ryan Fernandes, network operation manager, says switching from NetWare to Windows NT Server resulted in cost savings.**

ANNE HAMERSKY

Windows NT Server's management capabilities with the Active Directory, allowing administrators to manage system resources more easily and efficiently. Those are precisely the features that have Adaptec pumped up about Windows 2000 Server. Until last year, Adaptec relied on Novell NetWare as its primary file and print server, as well as for database and application serving. Adaptec switched to Windows NT Server, however, and the result was a savings in costs, reports Adaptec's Fernandes. The company anticipates even greater savings to come with Windows 2000 Server, he notes.

← Continued from page 9

IDC states: "Windows NT is already a requirement for success among virtually all industry vendors." IDC projects Windows NT Server to surpass NetWare as the top installed server OS by 2000-

2001. Looking ahead to clustered Intel servers, a new hierar-

chical Windows 2000 Active Directory, and other advanced features in the Windows 2000 operating system, it will only get better.

The same will likely be said for midsize organizations. Windows NT Server gives midsize organizations what they need to compete in the information-driven environment of the 21st century: a flexible, efficient, and open computing infrastructure based on Windows. ♦

FOR MORE INFORMATION AND TO ORDER AN EVAL KIT, VISIT:
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Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs,
Access Devices, Clients, Servers, Operating Systems, VPNs

Briefs

Cisco has rolled out new hubs and switches for small and mid-size enterprises:

- The FastHub 400 stackable managed hubs support 12 to 24 10/100M bit/sec autosensing ports and one 100M bit/sec backbone. The FastHub 400 10/100 series is available now, with list prices starting at about \$900.
- The new Catalyst 1924F switch combines 24 desktop Ethernet ports with two high-



Cisco's new stackable FastHub 400s.

speed fiber uplinks. A standard 1U version of the switch is available now, starting at roughly \$1,800.

- The 1538 Micro Hub provides eight managed or unmanaged shared media 10/100 ports, while the 1548 Micro Switch provides eight managed or unmanaged switched 10/100 ports. Both products are available now. Pricing for the hub starts at about \$500, while pricing for the switch starts at roughly \$1,000. Cisco: (408) 526-4000

OpenConnect Systems has produced a set of tools for building programs that give Web users access to back-end data and applications.

OC://WebConnect Enterprise Integration Server makes use of technologies such as Enterprise Java Beans and COM/DCOM, and provides access to SNA, transaction monitoring and database applications, among others. Enterprise Integration Server can be used to build applications that work with application servers from Microsoft, Netscape and Oracle. The product will be released later this month. Pricing begins at \$45,000.

OpenConnect: (972) 888-0415

Server vendors rally around Pentium III

BY DENI CONNOR

SAN FRANCISCO — A slew of vendors this week will introduce four-way servers based on Intel's new Pentium III Xeon processor and preview eight-way systems expected to process applications about 30% faster than four-way machines.

The server announcements are coinciding with Intel's 500-MHz Pentium III Xeon processor debut, which will take place at events in San Francisco and New York. While the Pentium III Xeon only runs a bit faster than the fastest Pentium II Xeon, Intel is also releasing its long-awaited Profusion chip set. Profusion will enable vendors to build eight-way symmetrical multiprocessing servers ideal for handling database, on-line transaction processing and other processor-intensive applications.

"We consider 1999 to be the year of the Intel eight-way server," says Dan Dolan, an analyst at Dataquest in San Jose. He says eight-way machines will take over for four-way machines that are running out of steam in data centers and other enterprise network sites.

Compaq is introducing a two-way Pentium II server, a four-way Pentium III Xeon server and an eight-way Pentium III Xeon server that uses the Profusion chip set. Each server is available in rack-mount and pedestal versions. The four-way 6400R allows up to 10 servers to fit in a standard rack enclosure.

While the new servers will be more powerful than previous models, some users are just as interested in the size of the machines. "The Compaq four-way server is a very small profile rack-mount server," says Paul Stein, manager of technology services at Olsten Health Services in Overland Park, Kan. "In our branch and small offices, we are very space-constrained. We are always looking for a server that is extremely scalable and has a very small footprint."

Compaq's two-way 1850R and four-way 6400R share common components, such as system fans, backplanes and Ultra2 drive cages, allowing easier repair, maintenance and upgrades. The 6400R and the eight-way 6500R share common system and memory boards, processors and hot-pluggable PCI boards. The two- and four-way servers will ship in April. The 6500R will ship when the Profusion chip set is ready. Compaq has not yet established pricing for any of the machines.

Hewlett-Packard and Data General also will be announcing products this week.

HP will upgrade several NetServer models with Pentium III Xeons and demonstrate an eight-way NetServer, dubbed the LXR8500. Pricing and availability information was not available.

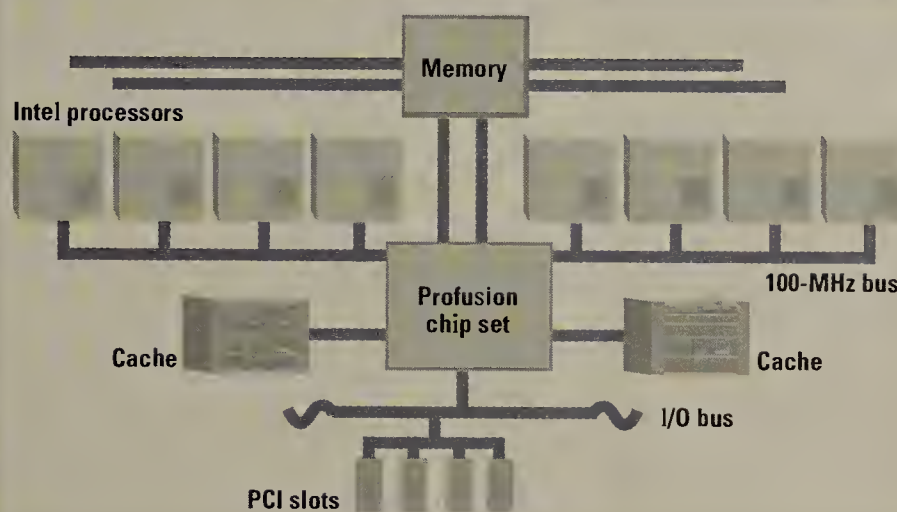
Data General is expected to announce

four-way servers based on the Pentium III Xeon. The company has said that these machines will be upgradable to eight-way systems in the future.

Dell and Unisys will also be showing off new four-way servers at the Intel event this week, but further information was unavailable. ■

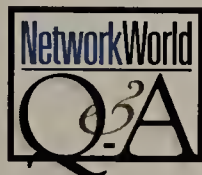
How to build an eight-way server

Intel's new Profusion chip set will coordinate communication within a server across memory, processors, I/O ports and caches. Compaq, HP and others are rolling out servers based on this chip set.



AIX is not just for IBM users anymore

IBM to license its Unix variant to other hardware makers.



Even if you don't plan to install any IBM RS/6000 servers, Rajiv Samant thinks AIX, IBM's version of Unix, could be coming to a server near you. IBM's AIX general manager recently spoke with *Network World* Senior Writer Marc Songini about where IBM is headed with AIX.

Where do you see AIX going?

We believe that with AIX we have technology leadership. To date, it has been tied to the RS/6000 business, but over time we will freely distribute it to OEMs and business partners. We launched this program called Monterey in October, and we had eight OEMs sign up to take AIX and use it in their prod-

ucts. [Note: For the Monterey project, IBM joined with The Santa Cruz Operation and Sequent to create a unified version of Unix for machines based on 32- and 64-bit Intel processors.]

Why does AIX have such a low profile vs. other Unix flavors?

You have to go back to the history of AIX. It is closely tied to the RS/6000, so historically we have not focused on branding the AIX operating system. We have focused more on branding the RS/6000 system.

How is IBM enhancing AIX's communications features?

We have several areas where we have focused. One area is clustering. E-busi- See AIX, page 16

2005: A Microsoft odyssey, Volume II

BY CHRISTINE
BURNS

This is the second of three articles exploring what might lie ahead for Microsoft should the U.S. Department of Justice win its antitrust case against the software giant. In last week's installment, we imagined what would happen if Microsoft was split into different companies. Here we envision a world in which Microsoft has been forced to give away the Windows source code as a way of remedying its alleged anticompetitive behavior.

Scenario 2: An open Windows for the world

After browsing an online news site, Bill Gates slams his mouse down in a fit of anger. He sputters to himself that the press is having a field day at his expense. For the hundredth time, he vows to stop reading about the never-ending stream of bugs in those parts of the Windows operating system that Microsoft didn't build.

"It's those Open Source geeks that are wreaking havoc on my Windows world," Gates laments. Instead of getting enthusiastic developers such as those committed to Linux, the Windows freeware following is

regularly infiltrated by a group of talented coders determined to bring Windows down. There is a covert "kill Windows" mission in place, and it's making Windows the butt of every industry prank and joke.

For example, there

their twisted ideas?" he asks himself aloud.

Gates knows all too well that every negative Windows article means he'll get at least a dozen "Dear Bill" letters from formerly loyal independent software vendors telling him they just can't afford to keep building their applications on top of an unreliable operating system. He's witnessed his developer community drop by 63% since former Attorney General Janet Reno forced him to give up his intellectual property without a dime in compensation.

Even worse, Gates can't rein in the PC makers anymore because they've all tweaked the software to run on their proprietary hardware.

Gates throws the newspaper into the recycling bin and thinks back to how he tried to limit access to the Windows code while staying in line with the court order.

Gates did indeed make the Windows source code readily available; well, at least it was available to anyone who really wanted it badly enough. He still grins when he thinks about how he originally opened Windows. He posted the 60 million lines of Windows 2000 code on Microsoft's corporate Web site in accordance with the court ruling. But then he placed it on a segment of the site that was accessible only via

was that "Dear Sis" service that one hacker built back in 2002 that sent annoying mail to Gates' sister every time the end user hit return. He still gets an earful about that one every holiday.

It's the Monday after New Year's Eve. Gates gives up on the World Wide Web, grabs a stack of trade rags and sits down on his virtual-reality dirt bike to multitask — his term for exercising and doing some old-style reading. "What's this Y2005 bug they've got here?" he asks himself as he pumps his legs and reads on. "Unsuspecting Windows PC owners were humming to Auld Lang Syne last week while their machines were all trying to connect long-distance with the same Web server in Bora Bora."

"Where do these guys get



Memotec to unveil flexible access switch

BY BOB BROWN

MONTREAL — Memotec Communications next week will introduce an access concentrator that supports voice, video and data traffic across a variety of WAN services.

The CX950 Multiservice Access Switch, which can sit in a big corporate site or a remote office, is designed to perform jobs typically handled by more than one access device or concentrator. Because the product includes interfaces for frame relay, ISDN, ATM and IP, customers can use a mix of WAN services and migrate from one

service to another.

The eight-slot switch can be outfitted with any of 31 modules, most of which also work in the company's existing CX900 switch. But Memotec has introduced a T-1/E-1 ATM module that only works in the new switch. This module is aimed at serving the many companies migrating from frame relay to low-speed and lower-cost ATM access services, says Joseph Mangiocavallo, Memotec's product marketing manager.

The new switch also includes modules for 10/100M bit/sec LANs, voice compression and voice over IP. The CX950 fits

into the middle of Memotec's product line, which includes branch and high-end devices.

Memotec, known for its frame relay gear, is repositioning itself as a provider of network traffic convergence products. Mangiocavallo recognizes that Memotec is not alone in targeting the convergence market, but claims the company has an edge, given Memotec's years of experience in selling convergence products in the form of frame relay access devices.

The new switch is in beta testing now and will ship in April. Pricing starts at \$4,500.

Memotec: (514) 738-4781

might give us the win we're looking for.

"We've still got all the best Windows programmers on board here, right? None of them can afford to leave because their stock options won't buy a tent, let alone an early retirement dream house on Lake Washington. So let's corral that talent and sell a 'Microsoft approved' version of Windows," Ballmer says.

Gates rocks back and forth, back and forth. He hasn't done this since the government started to restrict how he can act on his anticompetitive impulses. It feels good.

"We can lock down the only stable version of Windows," Gates says. "We can control the interfaces. We can make it an industry standard. We can bundle it with our applications. We can convince consumers they need PCs that have our logo."

"History will repeat itself, only this time they won't catch us," Gates vows. ■

AIX,
continued from page 15

ness is increasing the requirement for load balancing and dynamic resource sharing. Clustering is going to be a major area of focus and a key source of differentiation.

The second area is interoperability between AIX and other operating systems. The reality is that no customer will have a single-system environment. Most customers that have Unix may have a mainframe and other Unix servers.

The third area is just ease of use. There is a page we can borrow from NT in terms of usability, ease of installation, portability and things like that.

Do you see any industry-wide effort to make different Unix flavors converge?

The industry is being shaped by support for the volume-leading Unix implementations, such as IBM's AIX,

along with those products from Hewlett-Packard and Sun. It's not as if these Unix

versions are getting homogenized from a programming interface standpoint. What's going to happen in the next 24 months is there will be fewer Unix versions left.

IBM has announced support for Linux in its Netfinity server line. Where do you see Linux going?

Some customers for some reason do value open source code. The key question is whether open source will have a broader appeal than just for those customers technically proficient enough to deal with configuring their own operating system.

My gut feeling is it's a small segment of the market, but time will tell. The other question involves independent software vendors. Most ISVs don't necessarily benefit by supporting yet another platform. ■



IBM's Rajiv Samant is untangling AIX from RS/6000s.

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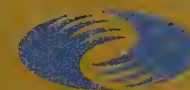


The word is out. Far too many enterprise management projects don't deliver. So, what's the hang up? Recent industry analyst studies reveal that most major framework implementations take too much time and don't deliver ROI. After years of work, only a small portion of purchased functionality is actually implemented. There is a better way.

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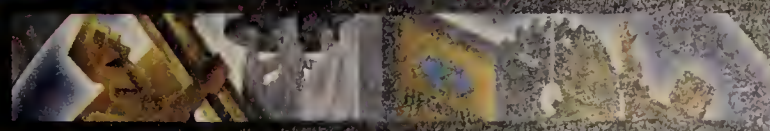
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NCD extends thin-client software to PCs

BY JOHN COX

MOUNTAIN VIEW, CALIF. — Network Computing Devices (NCD)

this week will extend its thin-client software to cover Windows PCs that need to access server-based applications.

The company is relabeling existing software and adding load-balancing and remote configuration tools to form a new client and server software

line called ThinPath.

The software will enable companies to use common tools to manage terminals and PCs within a thin-client environment. In the past, NCD's software worked only with its own line of ThinStar Windows-based terminals.

Manny Aponte, chief information officer at Stormont-Vail HealthCare in Topeka, Kan., thinks ThinPath is a great idea. Stormont-Vail is deploying several hundred thin clients to provide fast access to patient records and applications as well as speed up the deployment of software to end users.

"I came from an environment with 12,000 PCs," Aponte says. "If you try to install new client software on that many desktops, you'd better have a heck of a large staff."

By contrast, with the ThinPath suite, Aponte will be able to group servers together, spread the traffic load over a server cluster and remotely configure terminals and existing PCs.

ThinPath's new components include a load-balancing client for PCs that gives end users access to the least-loaded server in a cluster and launches the desired application. ThinPath Load Balancing software pricing starts at \$395 for a five-user license.

ThinPath Plus lets PCs work with attached magnetic stripe or bar code readers and similar devices in conjunction with a server-based application. It also lets server applications make full use of Windows audio technologies, such as MIDI and AVI files. Pricing for ThinPath Plus starts at \$295 for five users.

Over the next two to three months, NCD will release several new products under the ThinPath label. These include:

- a central database for setting up thin clients;
- a Web tool for accessing remote terminals and diagnosing problems;
- and remote shadowing, which will let net managers view a client display for any client on a network.

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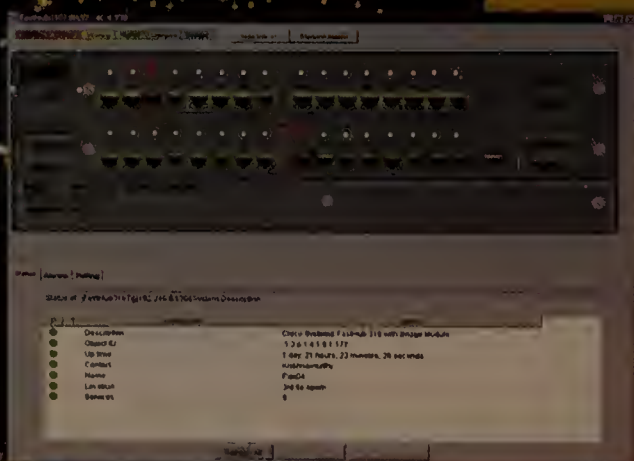
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WHEN NOISE MEANS NOTHING

There's been a lot of noise on the directory services front over the past few weeks, but Macbeth's words probably best sum up the recent news:

"It is a tale told by an idiot, full of sound and fury, signifying nothing."

Oracle finally got around to recognizing the importance of directories with

its announcement of Oracle Internet Directory. Why "Internet"? Because it's a buzz word, or at least Larry Ellison thinks so. But Larry's never been known to be on culture's cutting edge. (Even his lifestyle is stuck in the '60s — read Mike Wilson's book, *The Difference Between God and Larry Ellison*.) The

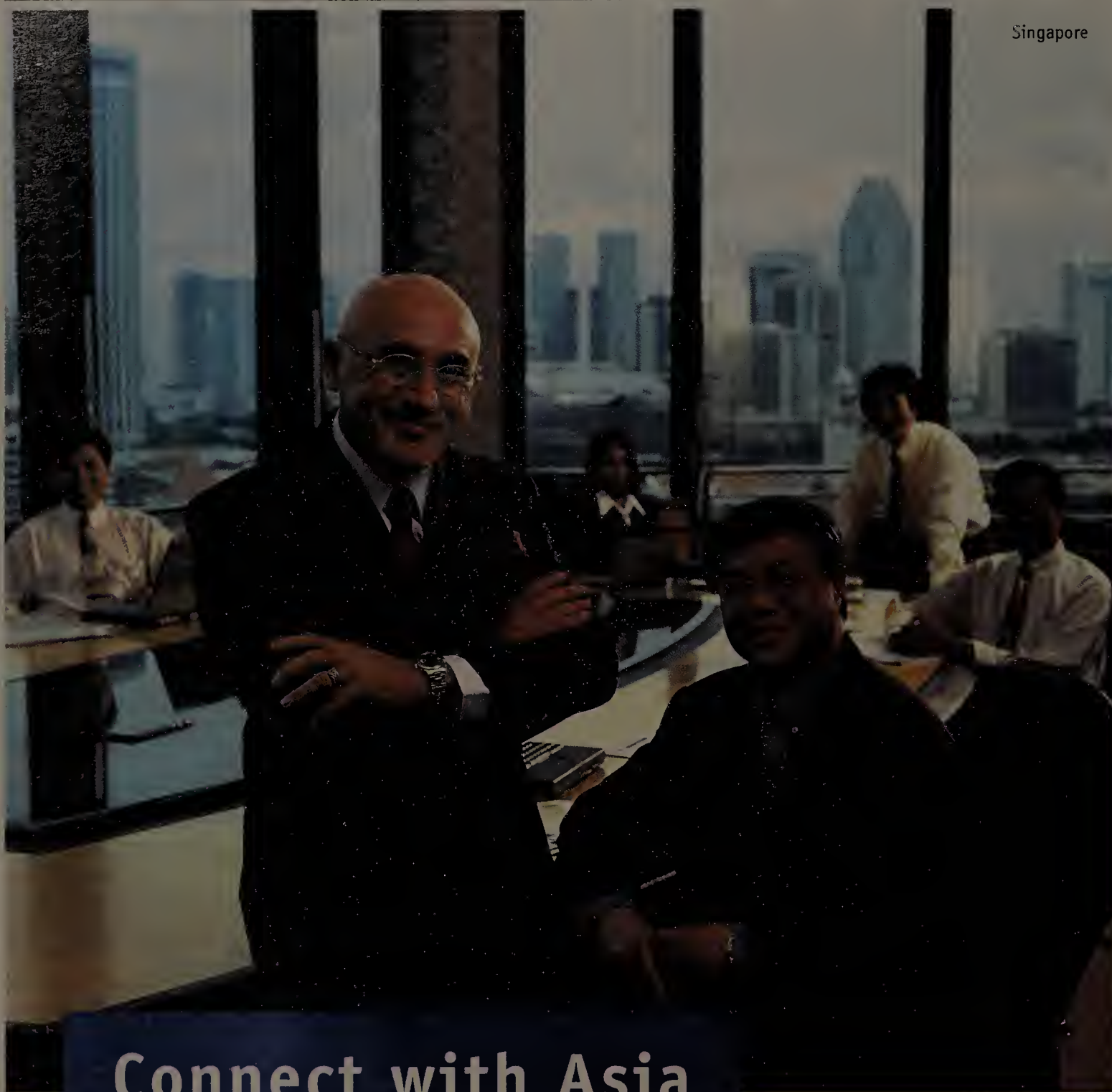
product should have been released years ago to leverage Oracle's database supremacy. After all, what is a directory except a special form of database?

Earlier this month, Entevo released Version 2.0 of its DirectManage product for NT networks — an outstanding product bringing a semblance of directory services to Microsoft's inane domain structure. (See this week's Focus on Windows NT newsletter at www.nwfusion.com/focus/ for more about Version 2.0). That should have been enough, but unfortunately Entevo also announced the DirectAdmin NDS Plus Pack — a virtual directory for your mixed NT and NetWare network administered from NT utilities. Hello? If you're already using NT to administer your network, what's the point of having a NetWare server? And if you have a NetWare server, you should be running NDS for NT, a far superior product.

Finally, Sun, Lucent, CheckPoint Software, Cisco, IBM, Microsoft and Nortel Networks, among others, joined together under the leadership of Process Software to "continue efforts in developing an industry-standard schema within the Internet Engineering Task Force for directory-enabling the Dynamic Host Configuration Protocol (DHCP)," a recent Process press release stated. The IETF's DHCP Working Group hopes to tie into the Common Information Model (CIM) being developed by the Desktop Management Task Force (DMTF), which is currently trying to incorporate the Directory Enabled Network (DEN) initiative. Can anything good come from so many acronyms?

In case you've been asleep, by the way, Novell Directory Services already manages DHCP quite well. Maybe all the noise does signify something after all — Novell's complete domination of directory services.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.



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Tip of The Week



HiTecSoft has opened an Internet portal service that provides users with a one-stop site for all the latest patches for popular operating systems, such as Windows 3.X, 95, 98 and NT, as well as NetWare, Linux, OS/2 and DOS. Also available from HiTecSoft is Gravitix, software that can analyze operating systems and provide users with a report of all software drivers that need to be updated. Go to www.patchlink.com/ for all the details.



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Briefs

Qwest soon will roll out its first electronic commerce service. Called Q.Commerce Retail, the service is based on Microsoft's Site Server Commerce Edition software. Qwest's Q.Commerce Retail is a business-to-consumer e-commerce service. The initial set-up fee is about \$150,000, and monthly service fees are about \$10,000. Q.Commerce customers get a Compaq Proliant NT server, Microsoft's e-commerce software, up to 10M bit/sec worth of dedicated bandwidth, TanData management software, Taxware software, which provides local tax tables, and CyberCash to clear transactions. Qwest's services will be rolling out over the next three quarters.

Qwest: (800) 860-2255

MCI WorldCom says it will integrate its Advanced Networks division with **UUNET**, the world's largest ISP. After a year of trying to organize its multiple product offerings, MCI WorldCom says it wants only one ISP subsidiary. Services from the two divisions are expected to be combined and renamed in the next few weeks. Also, UUNET moved President Mark Spagnola into the CEO position. John Sidgmore is now chairman of UUNET and vice chairman of MCI WorldCom. Former president of Advanced Networks, Peter Van Camp, is now president of Internet Markets at UUNET.

UUNET: (703) 206-5600

Bellcore last week changed its name to **Telcordia Technologies**. Since Science Applications International acquired Bellcore in 1997, Bellcore's design focus has shifted from building circuit-switched, voice-only networks to developing packet-switched, high-speed broadband technologies. Telcordia expects to develop cable, Internet and voice/data convergence technology.

Siemens takes aim at data net field

Forms new company — Unisphere — to target U.S. corporate and carrier markets.

BY DAVID ROHDE

NEW YORK — PBX vendors are scrambling to grab a chunk of the rapidly consolidating data network market.

Siemens last week became the last of the top three U.S. voice equipment vendors to enter the data business by funding a new company that will offer data equipment to carriers — along with LAN, WAN and IP telephony gear to corporate users.

The move is designed to help Siemens keep pace with Lucent's and Nortel Networks' dives into the data network pool. Together the three companies form the long-standing Big Three of U.S. PBX vendors.

In the past year or so, Lucent, Nortel and other companies have been snapping up data network vendors to compete more effectively with Cisco.

Siemens' new company, called Unisphere Solutions, is a separate U.S.-based company that will offer hardware and software for data nets and converged voice/data networks.

To get Unisphere off to a running start, Siemens purchased two Boston-area carrier product start-ups focusing on broadband IP and ATM gear: Argon Networks and Castle Networks.

Siemens also invested in a California start-up, Accelerated Networks, which offers service-provisioning and protocol-conversion software that provides digital subscriber line access to ATM backbones.

Siemens has contributed parts of its own recently reorganized U.S. carrier and enterprise networks business to Unisphere. The contribution includes a

PROFILE: UNISPHERE SOLUTIONS

Headquarters:	Burlington, Mass.
Web address:	www.unispheresolutions.com
CEO:	Martin Clague, former IBM vice president for networked computing solutions
Internetwork equipment available to sell:	3Com and Cisco products via alliances and marketing agreements
Voice equipment available to sell:	Siemens' HiCom PBXs and RC3000 voice-over-IP gateway, plus voice LAN products under development with 3Com
Employees:	500
Incorporates:	<ul style="list-style-type: none"> Accelerated Networks, provider of broadband service provisioning software Argon Networks, maker of a gigabit switch router for service providers Castle Networks, maker of central office circuit-to-packet-switching conversion gear Siemens' Enterprise Data Networks, Broadband Networks and Internet Solutions groups



division called Enterprise Data Networks, though Siemens officials concede that besides marketing agreements with Cisco and 3Com, this division's products mostly consist of voice-over-IP entries rather than basic LAN and WAN gear.

Despite the hoopla that Siemens officials gave it at a press conference here, the establishment of Unisphere is just part of an ongoing — and company officials admit, still incomplete — effort to thrust the big German conglomerate into the U.S. data network playing field.

That effort began in 1997 when Siemens and 3Com announced a partnership to develop new products for converged voice and data nets. At the time, 3Com CEO Eric Benhamou promised that the two companies would produce convergence products within a year. Siemens and 3Com re-announced their relationship — this time as a joint venture — last December, but last week that venture was still not ready to go.

"We're still in contract negotiations [with 3Com]," says Frederick Fromm, president of Siemens' U.S. business unit.

Once the partnership is established, the two companies plan to combine

3Com's SuperStack II and CoreBuilder LAN switches with Siemens' call processing technology for LAN telephony and multimedia applications.

Partly because the 3Com/Siemens venture is still getting revved up, the Unisphere effort — which instead of developing products is designed to bring them to market — is also likely to have some holes.

For example, Fromm was unable to point to any Fast Ethernet, Gigabit Ethernet or Layer 3 switching products that Unisphere will be able to offer right off the bat.

Analysts say Unisphere's real emphasis is likely to be on gear for carriers offering managed IP services to users. "I see this as an outsourcing play," says Tom Nolle, president of CMI Corp., a consultancy in Voorhees, N.J.

Unisphere's president will be former IBM executive Martin Clague, who says he is excited about Siemens' worldwide presence.

"Siemens has made it clear that Unisphere is part of their future and that we'll enjoy the advantage of a ready channel of 26,000 sales and support people," Clague says. ■

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Wan Monitor . Daniel Briere and Christine Heckart

DATA VPN: A BABY STEP FOR NEW PROVIDERS

In our last two columns, we discussed what we believe is the next big step in network services: the Broadband Enabled Application Ser-

vice Provider (BEASP).

Several business models are emerging under the guise of the BEASP. These models include: delivering inte-

grated applications targeting a specific industry niche; providing software rental and revision management; creating and selling extranet components

designed for a specific community of interest; and other services.

Some BEASPs are starting from scratch, and a great deal of venture capital funding exists to back these businesses — for example, USinter-networking has received about \$100 million. Other start-up BEASPs include DBN, Corio, Service Net, Inter-path and Agillion.

BEASPs also are emerging from today's ISPs, emergent carriers and even content providers.

All these companies are looking for short-term differentiation and long-term survival, eyeing the enormous market opportunity looming with the BEASP movement. The hard part is building the business and migrating from what's possible today to where the opportunity is tomorrow.

A clear view of the future is not necessarily the same thing as a short or easy migration path. If BEASPs are successful, your relationship with your service provider and the network services you buy will undergo enormous changes in the next few years.

Virtual private network services can be an important stepping stone to BEASP services, which explains in part why data VPNs are all the rage. In making your purchase decisions for VPN services, you need to understand your provider's future plans to link VPNs to your directory and content, as well as quality of service.

Why is this important? If you want to conduct e-commerce over the World Wide Web, you want your potential customers to get a higher service quality than a user downloading white papers for school research. In fact, when the industry discusses applications for VPNs, it typically notes remote access, intranets and extranets.

According to "The TeleChoice VPN Market Report," e-commerce is right behind these three as a driver for deploying VPN networks.

VPNs that simply deliver connectivity but do not tie the network transport to the policy management system will not help you deliver appropriate service by user, application, time of day or destination.

If you're thinking of e-commerce and application hosting, you want the VPN to link to the network-based storage-area network and maybe even offer options for transaction processing or professional integration services. The BEASPs, having high-speed access and backbone facilities, are best equipped to deliver this network-based content storage and delivery.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com, respectively.



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Program Overview

Implementing a fully converged network requires the careful orchestration of a number of elements including terminals, voice and video codecs, gatekeepers and gateways to other networks. And for a successful implementation, you need all of those components to interoperate - an awesome task that involves adherence to a multitude of standards.

Instruction and guidance are what you need to accomplish this goal. Specifically, you need a complete understanding of the multimedia applications requiring integrated voice/data/video/fax transmission, the network architectures necessary to support those applications and the standards in place to ease your interoperability concerns. This seminar will teach you the steps to designing and implementing an integrated network that delivers cost savings and increased manageability.

Presented by Mark A. Miller, P.E.,
DigiNet Corporation



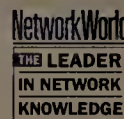
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- Understand how Quality of Service (QoS) issues become key factors for a successful multimedia network implementation
- Understand how network traffic patterns can impact a Voice over IP implementation
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Briefs

EGain Communications this week will unveil E-mail Management System 2.0 (EMS), the company's second-generation software for managing Web forms and e-mail generated by generic Web site addresses such as info@company.com. The upgrade includes new tools for linking EMS to customer databases and electronic commerce systems, such as those from Oracle and Microsoft. Artificial intelligence capabilities have been added to improve the suggested responses that EMS offers to customer service employees.

Expected to ship by the end of the month, EMS costs about \$50,000 for in-house deployment, while an EMS service hosted by eGain starts at \$2,900 per month.

EGain: (408) 737-7400

Netegrity has started shipping SiteMinder 3.5, Web access-control software that now runs on Sun Solaris and Windows NT. SiteMinder, which costs \$16,000 for 1,000 users, supports user authentication with digital certificates from VeriSign, Entrust Technologies, GTE CyberTrust, Baltimore Technologies and Microsoft.

Netegrity: (781) 890-1700

Look out, here comes another portal. After rejecting a merger offer from Open Text late last year, **PC DOCS** finally settled down with **Hummingbird Communications** in a \$155 million stock deal. Operating as a wholly owned subsidiary, PC DOCS will work to combine its document and knowledge management products with Hummingbird's Business Intelligence offerings to create an Enterprise Knowledge Portal, according to officials of both companies.

The deal will make Hummingbird one of the top 50 software companies in the world, with revenue of \$240 million.

Could you pass this tough security test?

BY ELLEN MESSMER

SHREWSBURY, MASS. — Most network managers learn about information security on the job, where they battle computer viruses and hackers and arrange for systems back-up as best they can.

It's hard to prove how much you know to employers eager to hire security expertise. But you've got bragging rights if you can say you are a Certified Information Systems Security Professional (CISSP).

More and more, the CISSP credential is popping up on paper and online business cards right next to Ph.D.

Corporations and government agencies want people with CISSPs credentials.

And if you can pass a grueling four-hour exam, you can be one, too.

The multiple-choice exam is given several times per year by the nonprofit organization with the long name of International Information Systems Security Certification Consortium, Inc., or ISC2 for short.

ISC2 started giving the exam, called the Common Body of Knowledge, a

decade ago. Slowly, it has gained great cachet.

"It's similar to the bar exam for lawyers," declares John Sekevitch, vice president and general manager of special services for firewall vendor Secure Computing in San Jose. "Of course, you have to meet people and look for their areas of specialization. But the ISC2 exam tests broad knowledge."

with them in terms of size, but in terms of our professionals, we can."

A total of 1,400 individuals have passed the grueling ISC2 exam to date; 70% of those who sit down to take the test pass it, says ISC2 spokesman Rick Koenig.

The exam is composed of 250 multiple-choice questions covering 10 areas, including: access control; telecom-

■ **"It's similar to the bar exam for lawyers. The ISC2 exam tests broad knowledge."**

John Sekevitch, vice president and general manager of special services, Secure Computing

The CISSP elite

Secure Computing keeps a stable of 28 CISSPs out of a total staff of about 40 security experts.

"We do this to compete with the likes of Ernst & Young," Sekevitch says. When it comes to providing hands-on security services, "We can't compete

munications and network security; applications security; cryptography; physical security; and business issues, such as law and investigations.

It is not recommended you take the exam unless you've had a minimum of three years' work experience in information security.

See **CISSP**, page 26

Foundry steals Cisco load-balancing customers

Complete Foundry switch has an edge over dedicated Cisco box.

BY ROBIN SCHREIER
HOHMAN

SUNNYVALE, CALIF. — Feisty Foundry Networks is winning over some Cisco server load-balancing customers, replacing the dedicated Cisco box with more general purpose Layer 3 and Layer 4 switches.

Based on low prices, shrewd marketing and a versatile product line, Foundry has been convincing some IT managers to replace the aging Cisco Local Director with Foundry's ServerIron 10/100/1000 switch.

"It's not that Local Director is an awful product," says Matt Davis, manager of corporate NT operations at Republic Industries. "It's a very basic low-end product without a lot of the functionality you can find on the Foundry products."

Davis was using four redundant pairs of Local Directors for nearly a year to distribute traffic on the company's Web sites. That's no small task, because Republic Industries owns National CarRental, Alamo, CarTemps USA and AutoNation, which



Foundry's ServerIron switch is luring people away from Cisco Local Director.

itself owns hundreds of new car dealerships across the U.S.

Hello... Cisco?

So you would think Cisco would pay

attention when Davis put in a trouble ticket, but he says that didn't happen. He says Republic wasn't able to successfully balance more than two or three Web sites, mostly because Local Director forces the creation of virtual LANs for load balancing.

"We never got a Cisco engineer out here to address the problem," Davis says, despite opening three trouble tickets with Cisco. "They'd tell us there's something wrong with our NT servers, with our routers."

Davis says the problem was that Republic's Web servers are rigged for both the Internet and the internal network, a configuration the Local Directors couldn't handle.

So when a friend recommended Foundry, Davis took a look. He wound up replacing the Local Directors with Foundry's ServerIron switches.

See **Foundry**, page 26



'Net Insider . Scott Bradner

MICROSOFT'S UNPRINCIPLED ACTION

That did not take long. Only a few weeks after the brouhaha over Intel's addition of a serial number to the Pentium III processor, along comes the disclosure that Microsoft has been inserting unique serial numbers of its own in files created with its Office suite of programs.

That's not all. Back in Redmond, Wash., Microsoft has also been building a database of which users are tied to which serial numbers. So if you are a whistle-blower who wants to remain anonymous, do not write your exposé using Microsoft Word. Your target could just subpoena Microsoft to find out the name of the software user who created the file.

Microsoft quickly announced that it would modify the registration

software to stop the software from sending the serial number to Redmond. The company is going to scrub the serial numbers it has received from its database and is thinking about creating a free utility program for removing the serial number from a user's computer.

Microsoft says the serial numbers were created as part of an effort to make it easier for Microsoft support technicians to diagnose problems that resulted from interactions between software packages. The company says it never considered the privacy implications of the feature.

I'm willing to accept that, even though I'm not quite sure how a software-specific serial number helps in diagnosing such problems. But it is quite troubling that

Microsoft was oblivious to the privacy aspects. Intel claims that it was also blindsided by the privacy advocates' attacks.

What is so hard to understand about the issues here? Even though Sun CEO Scott McNealy told us last month to get over the fact that people no longer have any privacy, it seems a no-brainer that it is not a good idea privacy-wise to create yet another way to keep track of what people do or create. But somehow this level of understanding seems to be unachievable in corporate America.

I sometimes wonder if there are any people in some of these organizations — people would have seen that if they do these sorts of things to others they are also doing them to themselves.

Missing from most of the debate over the Intel and Microsoft missteps and the ongoing fight over other personal data has been a statement of principle.

Here is an easy one to remember: People should be able to say who can get information about them and for what that data can be used. If Intel and Microsoft had thought about this simple principle, neither would have done what it did.

Disclaimer: If Harvard has principles beyond "Veritas," I'm not the one to intone them. Thus, the above is mine alone.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

CISSP,
continued from page 25

mation security.

The Federal Reserve of San Francisco just had about two dozen of its IS staff take the exam and is waiting for the results.

Not long ago, the State of Minnesota had its staff take the test, as well.

"Did we all pass? No," says Greg Dzielwczynski, the state's director of business and information services, who passed the exam. Why is the CISSP credential desirable?

"We're putting an expanding emphasis on security and security awareness, particularly as Minnesota moves forward into the e-business and electronic commerce side of the world," Dzielwczynski says. "My people were focused on main-frame security. But I want them not to just think about main-frames or Windows NT. The Common Body of Knowledge helps them think about the big picture."

Passing the CISSP exam suggests "you can effectively communicate with your colleagues," he explains. "You understand the jargon of security and security issues."

Calling all CISSPs

The State of Minnesota expects to soon contract out for the security service known

as ethical hacking — a probe to uncover any security vulnerabilities in the state's IT systems. Dzielwczynski says he would certainly prefer the contractor to have workers with CISSP credentials.

For one thing, CISSPs must take a vow to adhere to a high code of ethics that includes reporting unlawful activities.

The State of Illinois, the U.S. Postal Service, the Environmental Protection Agency, the Defense Information Systems Agency and the Defense Security Services also take great stock in CISSP.

Fidelity Investments in Boston is now advertising for a "Network Security Technology Leader" for its telecommunications division to combat risks on its internal networks and its Internet-based business.

The position reports to the senior vice president of Internet services and architecture.

Though not a requirement for the job, Fidelity states that CISSP certification is an asset.

Creating a college curriculum

Still, as tough as the CISSP test is, it simply underscores the desperate need for a professional benchmark for an area of expertise in which there is still so little formal

training, particularly on the university level.

"Most people in this field today got into this from their background in computer science or programming," says George Jelatis, Secure Computing's director of architecture services. "For one reason or another, they just required some security responsibilities, or they tried to develop expertise."

"There is no collegiate degree for this," says Mark Fabro, Secure Computing's director of worldwide assessment services.

But that is starting to change.

With input from the National Security Agency, James Madison University

(JMU) two years ago launched the first master's program in computer science with a concentration in information security.

"It's the only program of its kind in the world," claims Allan Berg, director of the information security program at JMU.

JMU's computer security

program is not focused on research but on "distilling practical knowledge into a professional program," Berg says.

Courses are held on the World Wide Web, and the first 17 students in the JMU program are expected to graduate this May. ▀

Foundry,
continued from page 25

ServerIron switches and plans to put in about 15 of the Foundry boxes by year-end. "We tested with Foundry's switches in the same configuration, and it works like a charm," he says.

The same thing happened at New Watch Co., a reseller of watches on the Internet.

"A friend of mine who runs an ISP is a big proponent of Cisco," says Jeff Helms, vice president of engineering at New Watch. "He buys all Cisco, and for him to tell me that ServerIron was a better piece of equipment than the Cisco Local Director meant something."

Helms ultimately replaced two Local Directors with two ServerIron switches to distribute traffic in front of a server farm comprising six Compaq dual-processor 400-MHz rack-mounted servers. The network is all Windows NT with 10/100M bit/sec connections.

"The Local Director doesn't

have as much throughput. It doesn't have near the capabilities for testing whether or not your servers have gone down, or whether they're currently functioning properly," Helms says.

"Local Director's kind of gotten long in the tooth, technology-wise," says Dave Passmore, president of consulting firm NetReference.

Not only that, the market is changing. "The thought that people need a separate product for that rather than combining [a load balancer] into the switch or the router is not particularly attractive," Passmore says.

Meanwhile, Foundry's on the fast track to an initial public offering for this spring, and the company's counting on making more inroads into server load balancing.

New Watch's Helms puts it this way: "We've got the Local Directors as paperweights right now, if anybody wants to buy them." ▀

More Online

- A forum for CISSPs.
- Articles on certification.
- An overview of the exam, including requirements.

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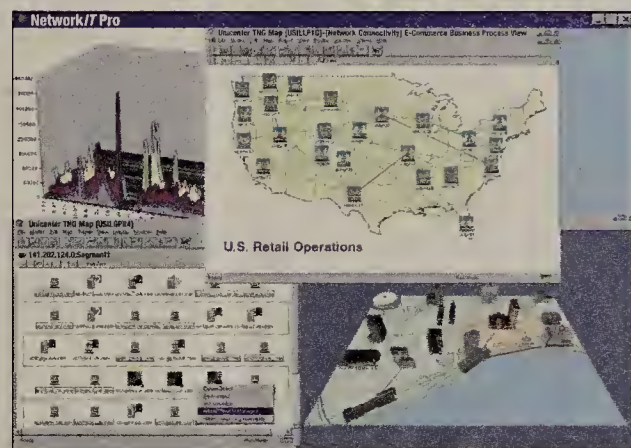
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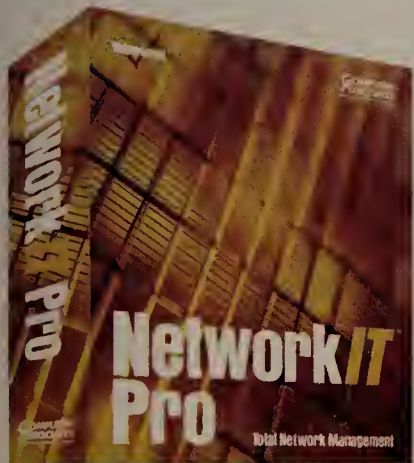
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NEW WEB TECHNOLOGY

XML servers enabling e-comm and Web models

BY ROBIN SCHREIER HOHMAN

In the past year, Extensible Markup Language (XML) has come a long way from being just an extension of HTML. XML is now vying with electronic data interchange for new business-to-business applications over intranets, extranets and the Internet.

XML specifies ways to represent data and makes data understandable to competing applications. For example, an Oracle database can understand a catalog, even if the catalog is held in Microsoft's SQL Server.

XML is also supported by Web browsers. A user can cull information from an Oracle database and view it in Netscape Navigator. Even better, with Navigator users can view the content from a product catalog.

XML leads to a lot of interesting business propositions. "We believe nearly everyone is jumping on the XML bandwagon — including nearly every application vendor that supports any publishing to the World Wide Web or supports APIs for transaction processing," says David Alschuler, an analyst at Aberdeen Group.

"Within three to five years, the majority of business-to-business commerce will be carried out in XML," predicts Philip Costa, an analyst at Giga Information Group.

"XML's gotten all this publicity on the client side, just like Java did, but it's on the server side that you need platform independence," says Coco Jaenicke, XML product marketing manager at Object Design, Inc. (ODI).

Three types of XML applications are:

- Those that get or create XML, such as Bluestone Software's XML-Server, a dynamic server that translates other data into XML.
- Those that view XML, such as Web publishing applications.
- Those that manage XML, such as ODI's Excelon, which performs application processing for XML.

One way to understand the process is to look at a fictional net primed for XML. In this net, our Oracle database, IBM mainframes and server farm lie at the bottom layer. On top of that is Bluestone's XML-Server. On top of that is Excelon. Then come the clients, including 500 workstations and two Web servers.

We use Bluestone's Visual XML to create the elements needed to turn disparate data into XML objects. We create Data Type Definitions (DTD), which spell out what each object is called. If we're using XML only to turn database records into XML objects, each DTD is roughly the same as each record, and each set of XML

XML server tools are starting to appear, but a revolution is already in the making, particularly in the fast-paced world of e-commerce.

tion, a browser or a device.

Excelon is used to distribute data to the next layer. Excelon is an application server that doesn't worry about distributing the load, where the data came from or what platform the data is running on. Excelon only performs the processing and serves up the data.

Excelon turns the XML elements into persistent objects. Unlike transient objects, persistent objects can be operated on. With persistent objects, you can conduct backup and recovery, survive network glitches, support XML extensibility and perform transactions.

"We're using XML as a communications protocol or a vehicle," says John Capobianco, senior vice president of marketing at Bluestone. "XML lives long enough to be communicated with," not stored.

One of the most advanced features in XML is its extensibility. Simply put, you can add a new tag to a customer record and not render all the other records unusable, or doom the application that's processing them. Without XML, adding an extra field to a relational database is sure to blow your schema, and either throw all your other fields off or confuse the application. Either way, you've got trouble.

With XML, applications ignore any tags for which they don't have instructions. As long as you tell the application, which could be anything from enterprise resource planning to a browser, what to do with the tag, it will correctly interpret the information.

If you're running business-to-business e-commerce, you might use WebMethods' B2B Integration Server. B2B serves as the link between your applications, such as

ERP and databases, and your partner's Web sites and ERP systems. B2B maps applications and data on both sides of the site into, and out of, XML.

If you think it sounds like EDI, you're right. If you think XML will replace EDI, the answer's not so simple. "Functionally, it's a replacement for EDI," says Phillip Merrick, president and CEO of WebMethods.

However, few companies are going to replace their established — and costly — EDI systems. Merrick sees XML slowly replacing EDI in e-commerce applications.

"We really believe that a lot of the application servers are going to offer XML services analogous to connectivity services and device services," says Josh Walker, an analyst at Forrester Research.

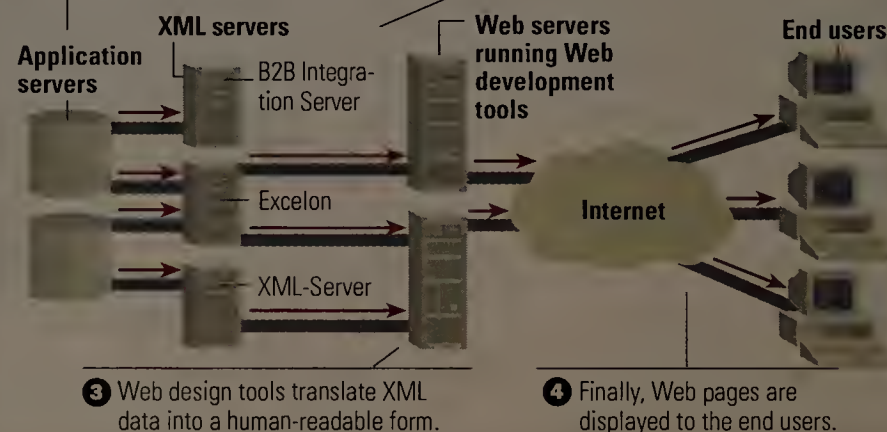
But, he adds, there will be few people using XML services in the near future, because everyone's in the wait-and-see stage. ■

How XML servers work

An XML-enabled network could use three different kinds of XML servers, all of which take data from data stores and application servers, translate it into XML, store it, give it business logic and serve it to the end user. These server programs sit in the middle tier of the network.

- 1 XML is able to interoperate with existing data stores and applications, including PeopleSoft and BAAN.

- 2 XML servers translate, manage and move XML data to Web sites.



tags is equivalent to the field name.

DTDs are stored in XML-Server. When each database record is passed to the XML server, XML-Server applies the DTDs. XML-Server then outputs fully formed XML objects and passes them along to Excelon.

If we're using XML-Server to create XML objects from applications, the process is different. We'll use Visual XML to turn the applications into Java doclets, which are Java programs running in XML-Server.

When you point Visual XML to a data source, such as an address, it creates a doclet that turns the data into an XML document and its DTD. By using that doclet, any application can read the XML and the DTD and turn it back into data for other applications to read.

Once XML-Server has converted data into XML, it's done. The server then passes the XML data objects to the next layer, either a Java or Visual Basic applica-



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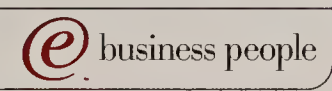
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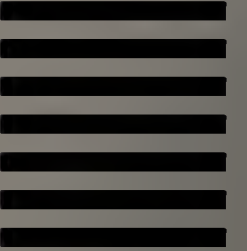
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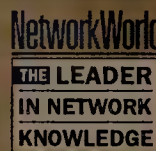
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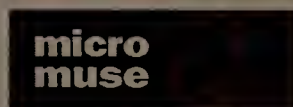
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bound port num-
bers for Post
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(POP3) support? I
need to restrict

access to one segment of our
intranet, on Ethernet Port E0,
and allow inbound and out-
bound POP3 support. I already
have Simple Mail Transfer
Protocol support allowed on
that port, but users coming
across the Internet into our
router via frame relay need to
pick up e-mail on the mail serv-
er on the E0 segment. The E1
segment is available to anyone.
Via the Internet

POP3 uses Port 110, POP2
uses Port 109 and the POP pass-
word server runs on Port 106.
Now when a client connects to
the server, it sends a packet to
the appropriate port number
mentioned. When the server
replies, it sends a packet from a
random port to the client port
from which the original packet
came. What this means for your
access control lists is that you'll
want to allow inbound traffic to
segment E0 on Port 110 and pos-
sibly, if you support POP2, Port
109. You'll also want to ensure
that your configuration allows
outbound traffic from the server
back to the client on randomly
chosen port numbers that vary
from session to session. It will
depend on your security policy
whether you allow all out-
bound traffic or whether you
filter the traffic on the server's
IP address, requiring that out-
bound packets be part of an
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Boosting SONET's high-speed capacity

BY DOUG FABER

SONET has long been the medi-
um of choice for delivering ser-
vices over metropolitan-area
networks (MAN). At its core,
SONET uses time-division multiplexing
(TDM) — a technology many experts
think is outdated and incapable of
delivering the high-speed data services
users are demanding.

That's where Bellcore's GR-2837 spec-
ification, which defines the use of ATM
virtual paths in SONET rings, comes in.
In a nutshell, GR-2837 specifies a way for
service providers to fill SONET pipes
with traffic on an as-needed basis rather
than having to provision TDM's set 64K
bit/sec rates.

The result: Access equipment is
emerging that enables carriers to deliver
a new class of integrated customer ser-
vices over a single link that combines
data, voice and video. Early examples of
networks that deliver integrated ser-
vices include Sprint's ION, AT&T's
Integrated Network Connect and MCI
WorldCom's OnNet.

Over the past 10 years, carriers have
installed fiber-optic cable throughout
every major metropolitan area in the
U.S. and have standardized the use of
SONET equipment. However, some
experts say SONET's TDM structure is
too rigid for flexible provisioning or
bandwidth sharing.

For instance, to provision a 10M bit/
sec LAN connection across a SONET
ring, a carrier must dedicate an entire
STS-1 pipe (51M bit/sec, see graphic) to
the connection. Once the STS-1 is dedi-
cated, no other sources can use that
bandwidth. This "stranding" of band-
width makes SONET's TDM structure
unsuitable for handling today's data-
centric network traffic.

Even though packet and cell tech-
nologies now dominate nearly every
segment of the network — Ethernet in
the LAN, frame relay and ATM in the
WAN, and ATM in the core — SONET
has prevented carriers from offering
high-speed end-to-end data services at
attractive rates.

The GR-2837 standard provides a plat-
form for developing multiservice trans-
port systems based on ATM. The systems
allow carriers to offer more high-band-
width data services over their existing
fiber-optic access and interoffice net-
works. Using GR-2837, equipment ven-
dors can map ATM cells into SONET for

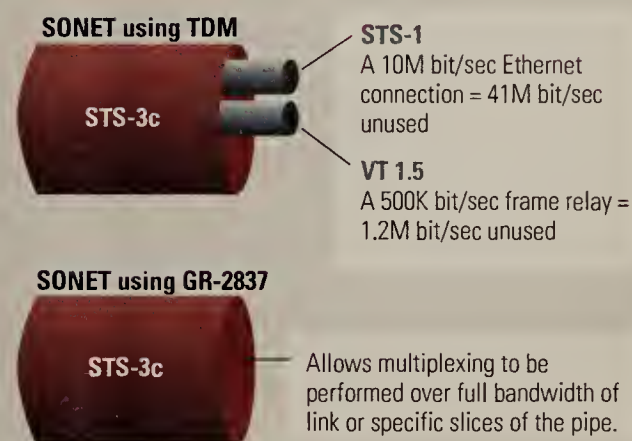
UP CLOSE

The Bellcore GR-2837 specification

Large metropolitan area
network providers have
long relied on SONET to
deliver high-speed
services. At its core,
SONET uses time-division
multiplexing, a technology
that divides a pipe into
specific bandwidths,
regardless of transmission
size. Detractors say TDM
wastes bandwidth. That's
where Bellcore's GR-2837
specification comes in.
Using GR-2837 technology,
users or service providers
can carve ATM virtual
paths within SONET pipes
to better utilize bandwidth.

SONET's TDM hierarchy

Designation	Speed
DS0	64 K bit/sec
VT 1.5	1.7 M bit/sec
STS 1	51 M bit/sec
STS 3c	155 M bit/sec
STS 12c	2.4 G bit/sec



maximum bandwidth utilization.

The standard describes several ways
of structuring the SONET interface,
including an approach that mixes
SONET and ATM STS-1 pipes on the
same high-speed interface, and an
approach that mixes, or concatenates,
the full bandwidth of the SONET facility
into a single ATM pipe.

The most efficient approach is called
full concatenation, which involves joining
the multiple pipes that make up a SONET
link. The larger the concatenated signal,
the greater the potential statistical gain
from using ATM bandwidth management.

The full-concatenation approach
allows ATM cells to be added or
dropped at any node and lets carriers
statistically multiplex traffic over the
full bandwidth of the link. Freed from
the rigid provisioning required by
SONET, carriers can dynamically allo-
cate bandwidth using ATM virtual
paths and virtual circuits on a tempo-
rary or permanent basis.

To illustrate the gains of statistically
multiplexing traffic, consider that, using
ATM, a carrier could offer several hun-
dred LAN internetwork services with a
2M bit/sec sustainable rate and a burst
capacity up to 10M bit/sec over an OC-
12 fiber-optic access ring. In compari-
son, a standard OC-12 SONET ring
could only support up to 12 LAN inter-

network services with a burst capacity
of 10M bit/sec.

The combination of full concatena-
tion of the SONET payload and ATM
bandwidth management also gives car-
riers the ability to offer new data ser-
vices, such as virtual private network
services at native LAN speeds and a
range of service-level agreements.

The GR-2837 approach for delivering
services over SONET also allows carri-
ers to sell a raw bandwidth envelope —
within which customers can configure
bandwidth allocation and quality of ser-
vice to meet specific application, user
and workgroup needs.

As an example, a customer could pur-
chase a 3M bit/sec variable bit rate ser-
vice from a carrier, and within that con-
tract provision 1.5M bit/sec for Web
traffic and 500K bit/sec for e-mail.
Bandwidth allocation can also be adjust-
ed dynamically based on the application
being supported. For instance, launch-
ing a videoconferencing application
could trigger a bandwidth-on-demand
connection that terminates at the end of
the videoconference.

Faber is director of product planning
and management at Omnia Commun-
ications, a maker of ATM equipment in
Marlborough, Mass. He can be reached
at (508) 229-8444.

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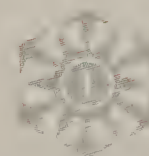
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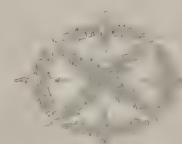


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Gearhead — inside the network machine . Mark Gibbs

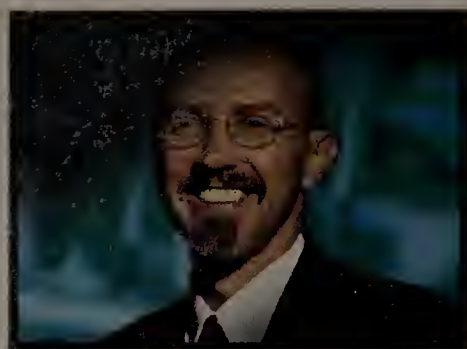
IP SECURITY: KEEPING YOUR BUSINESS PRIVATE

Without secure communications, much of the commercial potential of the Internet will never be realized because, whether you like it or not, there are people out there who want to know what you are doing. Some may just be curious, while others may want to harm you or your business in some way.

In response to this, we've seen the emergence of all sorts of protocols designed to enhance the security of Internet communications. For example, Secure HTTP is sophisticated and capable of providing fine-grained access control, but it is too complex for network administrators.

Today, the majority of secure Web traffic is protected by Secure Sockets Layer (SSL). SSL can be used with other protocols, such as File Transfer Protocol (FTP). While SSL works well, it applies only to data transmitted at the socket level. And worst of all, SSL requires the client and the server to be SSL-aware.

A more generic solution to secure data exchange is being defined by another protocol, IP Security (IPSec). IPSec is quite ambitious. It defines encryption, authentication and key



management to create, in effect, a virtual private network (VPN) session for every connection. In the structure of the Open Systems Interconnection model, IPSec operates at the network layer and doesn't require that applications be IPSec-aware, so all communications are secured.

Grossly simplifying, you could sum up IPSec's operation as two computers exchanging X.509 certificates for authentication and then creating an encrypted tunnel for data transfer.

The difference between regular IP packets and IPSec packets is the addition of an extension header and the encryption of the payload data. There are two parts to the IPSec extension header: the Authentication Header and the Encapsulating Security Payload

(ESP) header.

The Authentication Header defines which parameters will be used for authenticating the originator of data, checks integrity and protects the session from protocol replay. Protocol replay is a technique for breaking into systems by recording and replaying an exchange of data.

The ESP header specifies encryption methods and offers limited traffic flow confidentiality. It partially hides the details of how many packets of what size are flowing in which direction. This is important, as traffic flow information can be used to break encryption schemes. It also specifies the encryption and authentication keys and the time frame for which the keys are valid.

These two headers combined are called the Security Association, which describes what are referred to as the "transformations" to be applied to the payload datagram.

A Security Association may be static, containing data that is never changed by the transformation; or dynamic, containing data that is maintained by the transformation and changed whenever a datagram is handled. For example,

serial number-based replay prevention and sophisticated encryption systems that change over the course of multiple transactions involve dynamic data.

In either case, to begin a secure session both computers need to determine how they are going to "talk" to each other.

The protocol used to set up the connections is the Internet Key Exchange, yet another Internet Engineering Task Force protocol working its way toward finalization.

If you're getting the idea that this is complicated, you're right. This is why moving IPSec to a standard will take time. And IPSec has processing and management overhead, so it will have to be deployed with care.

IPSec is the best solution on the horizon. It will become the secure communications standard.

See the IETF documents RFC 2401 "Security Architecture for the Internet Protocol" at www.ietf.org/rfc/rfc2401.txt and RFC 2411 "IP Security Document Roadmap" at www.ietf.org/rfc/rfc2411.txt.

Communicate securely to gearhead@gibbs.com.



Who are you?

Scratch a network professional and you'll find ... a network professional.

As we gear up for our special You issue in July — a whole issue devoted to you, our readers — we're beginning to poll folks online about everything from how much coffee they drink in a week to what their dream job would be.

Early returns show that network professionals seem

to at least like the type of work they do just fine.

Sure, we've got some malcontents who say their dream job would be working for Barbados Airlines — in Barbados — but most respondents last week said they'd just as soon keep working in networking, at, oh, Microsoft or Novell.

Get last week's results (in addition to dream jobs, we asked network professionals about hours worked each

week) or take the survey yourself at:

DocFinder: 2029

The doctor is in

Shaun Kelly, our very own kindly Career Doctor (any resemblance to Marcus Welby is purely coincidental) holds office hours this week to answer your pressing career questions.

You can post them publicly or send them to him confidentially via e-mail. Certification remains a big topic.

Plus, download a digest of his answers to questions from his last session.

DocFinder: 2032

Antispam

Last week, *Network World* columnist James Kobielus blasted the "cyber-McCarthyism" of a group that maintains a blacklist of ISPs it

says condone spam. Some readers beg to differ. What do you think? Read their comments (plus Kobielus' column, if you missed it) and then add yours.

DocFinder: 2028

X marks the spot

Remember all the attention Java used to get? Now the Extensible Markup Language (XML) gets all the ink (well, what's left over from Linux, at any rate). But what do you do with it? A number of tools are beginning to emerge that make XML more than just another three-letter acronym in search of some venture funding.

One such product from Vervet Logic is XML Pro 1.2, a graphical development tool that helps Web designers make the transition from HTML to XML. It features XML validation, wizards to help create XML elements

and attributes, and a document-tree outline view. Plus its validation engine lets you do your DTDs (Data Type Definitions) in your BVDs.

XML Pro 1.2 supports the XML 1.0 specification and runs on 32-bit Windows platforms.

Download an evaluation copy of XML Pro and other XML editing tools from our Download area at:

DocFinder: 2030

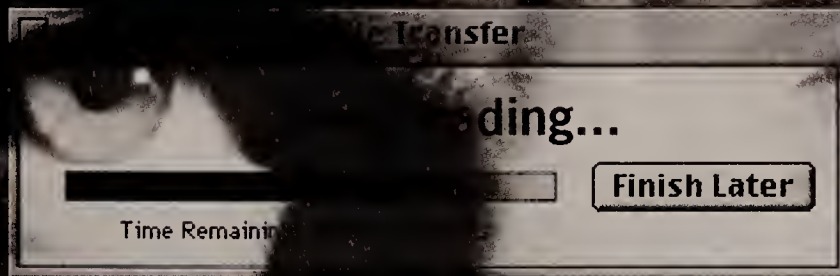
Too little, too late?

This week, "Wired Windows" excoriates Oracle for its directory strategy. What do you think? If directories are the future of networking (are they?), has Oracle blown it?

Read the column and discuss it or just browse a library of directory-related articles and links from *Network World* and elsewhere on the Internet.

DocFinder: 2031

www.nwffusion.com



FRAME RELAY

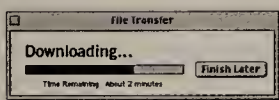
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Editorial Insights

Stop managing all those stovepipes!

Jim Herman illustrates the difference between network and service management with an anecdote. Herman, vice president of Northeast Consulting Resources, was hired by a European company to examine its IT strategy. But, from the CEO down, all the executives of this manufacturing powerhouse wanted to discuss was how lousy the e-mail system was.

It certainly wasn't owing to a lack of resources, says Herman, who's chairing our Town Meeting on network management. (You can learn about this free event at www.nwfusion.com/pdg/seminars.html.) The

company had some 120 e-mail servers around the world, and each site had a qualified, battle-hardened operations person managing the server.

So why was e-mail everyone's biggest complaint? Because no one was responsible for managing e-mail as a service, as opposed to a collection of devices, links and software. No one understood how people were using e-mail and what they thought about the service they were getting.

The message is simple: Adopt a service-level view of management. Don't just organize your resources around narrow disciplines such as managing NT, Unix, routers, Internet connections, etc. — what's known as stovepipe management. Manage the quality of the critical services and applications people use.

This requires a couple of things. The first is more interaction with users. Service managers have to live in two worlds: they must understand end-user perceptions of, say, e-mail service, and work with the underlying technology that users aren't concerned with.

Second, realize that you are increasingly managing services supported by devices you don't own. Case in point: Your executives no doubt rely on a few critical Web sites for competitive information and news. Are they happy with that service, and what can you do to improve it? This goes beyond looking at uptime on your ISP link.

Adopting a service management strategy can help you improve your department's standing in the company and get the resources you need to enhance infrastructure and applications.

— John Gallant
jgallant@nww.com



Message Queue

NO LONGER A SECRET

Your article "DSL has a DLS (dirty little secret)" (March 1, page 1) does a great job of calling attention to a little-known problem with digital subscriber line (DSL) access services: oversubscription, which may result in unpredictable performance. The reality is that DSL access multiplexers (DSLAM) do not support quality of service (QoS), which is the fundamental problem. Unlike ISDN, frame relay and T-1, which are dedicated services that provide the user with guaranteed bandwidth, DSL users compete with one another for bandwidth on a DSLAM's uplink on a "first-in first-out" basis. This is because DSLAMs typically support only the unspecified-bit-rate class of service.

However, there is low-cost DSL access service that guarantees bandwidth and QoS. This is accomplished by integrating ATM switching and DSL access in a single platform instead of maintaining separate devices, as is usually done today.

An integrated ATM switch and DSL access system supports multiple classes of service and traffic policing. ATM traffic management eliminates contention over uplink bandwidth. Each virtual circuit on a DSL line from the user can be assigned a traffic contract that specifies the characteristics of the connections among the user, the DSL access system and the ATM network. For example, a virtual circuit can be allocated a minimum fixed amount of bandwidth that will always be available. Service providers will begin to deploy this capability in earnest as more users become aware of it and require it as a condition for moving from T-1, frame relay and ISDN to DSL.

Tom Mitchell
Director, product management
Promatary Communications
Fremont, Calif.

IRIDIUM WOES

Regarding David Rohde's column "So how do you order Iridium service?" (Feb. 22, page 29): I had a similar experience with Iridium. Several months ago I filled out the information form on Iridium's Web site, and I haven't heard from anyone, either.

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

I would have thought that, with such high losses, Iridium would be very interested in customers, but that does not seem to be the case. It also seems quite interesting that neither Iridium's advertisements nor its Web site contain pricing information. I only found pricing from reading articles like Rohde's. Sounds like Iridium may have a marketing group but not a sales department.

Herbert Fillyaw
Chief information officer
Florida Department of Agriculture & Consumer Services
Tallahassee, Fla.

Like David Rohde, I tried to order an Iridium phone. Unlike Rohde, I was never able to get a price on the phone or service. I tried all seven of the official North American distributors. One of them actually answered and told me they'd send me some literature (which turned out to be the one-page flowery brochure without prices); the other three never replied.

Eric Rose
Cherry Hill, N.J.

Thanks for your excellent article on Iridium. I too wanted to buy an Iridium phone, but I couldn't get in touch with anyone from the company. When I finally did, nobody could answer the very reasonable, basic questions I asked regarding rates, coverage and technology. The company's entire attitude was: "Buy it first and find out everything later, when you get your bill."

Aneet Chachra
Seattle

Editor's note: We contacted Karla Williams, an Iridium marketing official, who told us: "Iridium has had some problems ramping up production from one of their two phone-set manufacturers, but full production is now underway. The newest and largest distributor, Sprint PCS, should be fully linked with Iridium's marketing and fulfillment systems in about two months. In addition, the Iridium Web site is being redesigned. Iridium also recently released a press statement acknowledging difficulty in training distributors and warning that sales goals for the first quarter will be missed, but reassuring lenders that they are seeing strong potential demand for the product."

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"Just how much advertising do we have to put up with to get that free PC?"



Totally Unplugged . Ira Brodsky

HOW IP-BASED NETWORKS WILL CONQUER TELECOM

Today's market leaders do a better job of monitoring the progress of new technologies than their predecessors did. This is because new technologies tend to spread like weeds.

IP-based telecom is a case in point. Given limited end-user acceptance of IP-based telephony products and services, one might easily conclude that IP-based telephony will never get off the ground. But the technology is also taking root in core networks. As veteran Internet watcher Gordon Cook put it, "Next-generation telcos — companies like Qwest, Level 3, IXC, Williams and Enron — are surrounding and enveloping the public switched telephone network like amoebas."

Superior price-to-performance ratio is key to the success of any new technology. There is now evidence that IP-based networks can carry voice traffic at a lesser cost than conventional circuit-switched networks. Not everyone is convinced, however, that IP-based nets can deliver the requisite quality of service. But such problems can be avoided by using dedicated IP-based networks with loads of bandwidth.

And plentiful bandwidth is close at hand. Spurred by the Internet's meteoric growth, optical network vendors have succeeded at bringing new technologies to market sooner than anticipated. Thus, we have seen the introduction of wave division multiplexing — and subsequently dense wave division multiplexing — about two years ahead of schedule. As a result, optical networking achieved a twentyfold increase in bandwidth last year: from 20G bit/sec to 400G bit/sec per fiber. All indications are that the phenomenal bandwidth growth will continue over the next few years.

Another reason IP-based networks will prevail is that next-generation telephone companies will use IP packets to transport all types of content — not just voice. This will lead to greater use of multimedia content in telecommunications.

The rise of IP-based, broadband networks was not the industry's original plan. ATM and SONET were supposed to be the twin pillars of next-generation telephone networks. Recent developments in IP-over-



glass threaten to greatly diminish the role of SONET and possibly eliminate ATM altogether.

Incumbent vendors hope to head off the threat of IP-based networks by promoting convergence with the public telephone network. But at best, they can only delay the inevitable because legacy telephone and IP-based nets represent conflicting models. The more they are employed together, the more obvious it will become that IP-based networks are superior.

IP-based networks, unlike legacy telephone networks, are built out of commodity components and push intelligence to their edges — where users and small developers live. By making telecom infrastructure accessible to a wider audience, IP-based networks will conquer the world.

Brodsky is president of Datacomm Research, a consultancy in Chesterfield, Mo. He can be reached at ibrodsky@datacommresearch.com.

Reality Check . Thomas Nolle

COMING SOON: A SEA CHANGE FOR THE CLECs

When the Telecommunications Act of 1996 was signed, many people visualized hundreds of competitive local exchange carriers (CLEC) digging up streets and installing new state-of-the-art access options. Instead, we got hundreds of attorneys digging through law libraries and seemingly little progress in improving access technology. But that may be about to change, and the surprise is that this change may not benefit CLECs. To create more competition, we may end up killing off some of the competitors.

For all the hype about competition, today about nine out of 10 CLEC lines are simply wholesaled from the incumbent regional Bell operating companies and resold. A few CLECs, such as Northpointe and Covad, have augmented basic copper loop with digital subscriber line (DSL) service, but they're in the minority. We've changed who sells telephony but not who provides it. CLEC operation may impact pricing, but most CLECs aren't doing anything for network technology because they aren't doing anything at all with technology.

Now the RBOCs are getting ready to become CLECs. At least two are now quietly restructuring their organizations and facilities in preparation for dividing themselves into an incumbent local exchange carrier entity dedicated to wholesaling and a CLEC entity dedicated to retail. We'll probably see the first of the divisions take place by summer.

Furthermore, in a rule-making scheduled for late

this month, the Federal Communications Commission will allow RBOCs to deploy infrastructure for advanced data services out of a CLEC subsidiary without being subject to the wholesale restrictions of the telecom act.

This will let an RBOC provide DSL service, for example, without having to share its infrastructure with competitors. For their part, CLECs can bundle voice access with DSL, something the act forbids RBOCs to do.

Data service users are going to end up the big winners in the new CLEC competitive race. If CLECs and RBOCs fight it out on the data access field of battle, the result can only be better, cheaper and faster access technology. Voice services are already inexpensive under competitive pressure, and RBOCs are expected to enter the long-distance market later this year, driving prices even lower.

The total profit margin on voice could well shrink to a little more than 20%, which isn't much better than the wholesale/retail spread the CLECs rely on today. Data, on the other hand, can generate margins approaching 60%. With data profits, CLECs can deploy their own infrastructures. With voice profits, they can't. Get the picture?

Rebirth of TLAN

The first revolution in CLEC data services is likely to be a rebirth of the concept of transparent LAN (TLAN) services. TLAN is by nature a local service, so it fits the CLEC's limited service geography. In Canada, where CLECs always had a time limit for wholesaling from the incumbent, TLAN is probably the most popular CLEC profit source.

TLAN is also more versatile than its early applica-

tion, as a kind of metro-LAN for users with multiple local sites, would suggest. A TLAN user could reach an ISP through the TLAN service connection.

Likewise, the user could reach an IP virtual private network (VPN) service, or even a frame relay service. The CLEC could thus sell the user TLAN service for local site networking and then sell access to national VPN and Internet services.

Then, to further profit, the CLECs could turn around and charge the VPN interexchange carriers or the ISPs for access to the customer.

This happy new world won't be without challenges for the CLECs, however. Most don't have the capital or the skills to build networks. As a result, it's possible that more than half the CLEC lines now in service will be returned to RBOCs as CLECs go out of business.

There will be a lot of groaning and gnashing of teeth when the new market emerges, much of it from CLECs that don't want to invest in infrastructure. Ignore them and focus on those CLECs that are willing to prove themselves in the real market.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or tnolle@cimicorp.com.



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WHITHER THE WIRELESS DREAM?

BY CHRIS NERNEY

In a year when a record amount of venture capital money was poured into network start-ups, no single technology drew more deals or dollars than wireless.

Between the fourth quarter of 1997 and the fourth quarter of 1998, 85 different wireless start-ups received \$776 million in 101 separate funding rounds, according to the PricewaterhouseCoopers/Network World Venture Capital Survey.

That dollar amount comprises nearly 14% of all venture funds given to network technology and services start-ups.

But neither this funding tsunami nor the ongoing rollout of services from established vendors will necessarily translate into a wealth of wireless products and services for network managers. Technology limitations, lack of customer enthusiasm for corporate wireless services and tough competition from carriers pose formidable challenges for vendors and service providers to overcome. The upshot is that you shouldn't plan to rely on wireless anytime soon.

Despite these obstacles, the key elements needed for wireless to work in the enterprise — vast networks of towers and satellites, middleware and an array of useful wireless applications — are falling into place, albeit more slowly than many people had hoped.

Launching services

There are two basic types of wireless service: fixed, which delivers services to a building; and mobile, which reaches a moving target. In terms of the ability to transmit data reliably, fixed wireless is far ahead of mobile.

Vendors such as Advanced Radio Telecom, NextLink, Teligent and Winstar already provide high-bandwidth, fixed wireless services to customers in and around many major cities. AT&T and BellSouth also offer services in most large markets across the U.S.

"The technology is becoming a bit more ready for prime time," says Todd Dagres, a partner at Boston-based venture capital firm Battery Ventures. For example, a few service providers, such as NextLink and Winstar, plan to deliver Internet service over broadband wireless, making a T-1 pipe accessible to sites that aren't part of a fiber ring.

In February alone, there was a flurry of acti-

Venture capital firms continue to pour money into wireless start-ups, but few of the investments will yield a windfall of corporate wireless services.

vity in the wireless market:

- Network equipment giant Cisco and cellular phone maker Motorola announced they would invest \$1 billion over the next four or five years to develop a standard for using Internet technology to enable wireless networks to transmit data, voice and video services.

- British Telecommunications and Microsoft announced plans to offer Internet-based wireless network products and services, as did Nextel Communications and Netscape in a separate venture.

- Globalstar launched four more low-earth orbit (LEO) satellites, giving the firm a total of a dozen satellites for providing voice, data, fax and messaging services.

- Teligent launched wireless phone and Internet access in four more cities as part of its push to service 40 markets by year-end.

- PSINet announced plans to expand its wireless Internet access service, PSINet InterSky, to 11 U.S. cities by year-end and to 50 cities by the end of 2000. The company also plans to roll out the service in a dozen other countries.

This growth in wireless choices is good news for network managers in metropolitan areas. For corporations based in smaller population centers, however, wireless may be an unfulfilled dream.

"Wireless is coming real soon in a few places, three to five years in many places, and never in some places," says Bill Frezza, a general partner with Adams Capital Management, a venture firm in Sewickley, Pa.

Vendors delivering wireless services aren't likely to build antennas in areas where there aren't enough customers to make the upfront expenditures pay off.

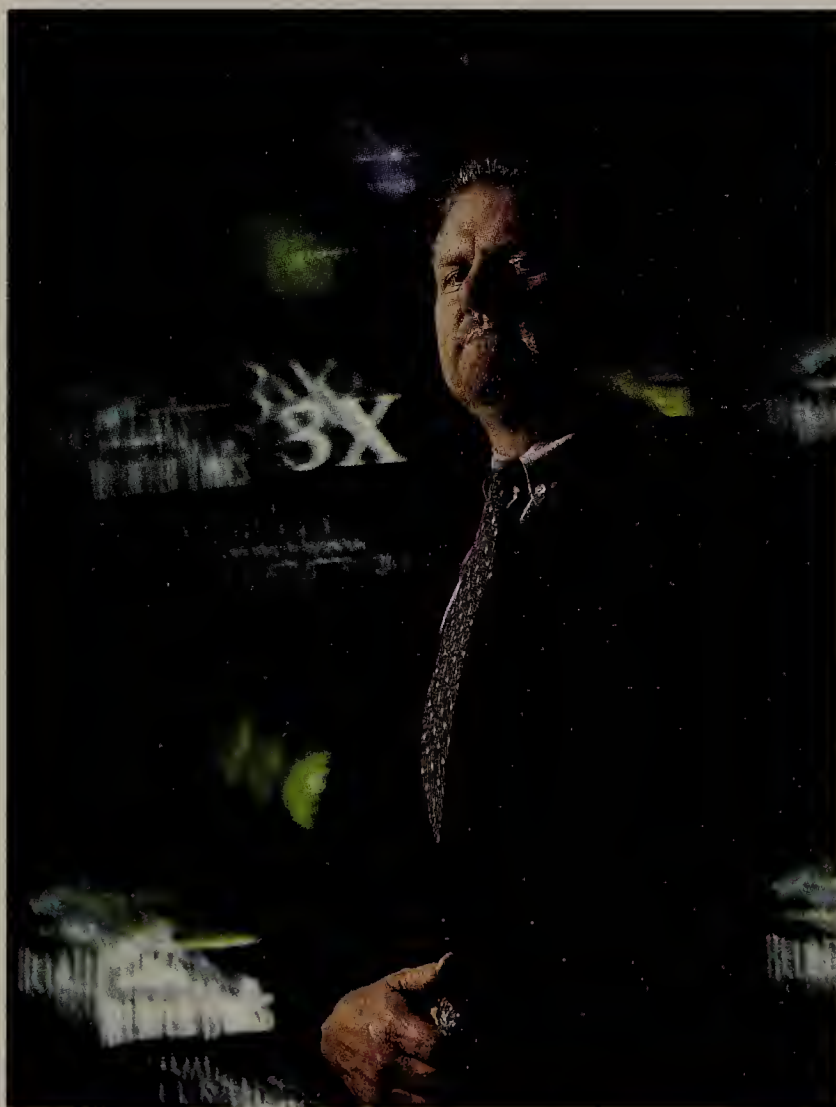
"For carriers to profit, there needs to be widespread deployment within an antenna's coverage area," says Judith Horton, research director for AT&T Ventures, the telco giant's investment arm, which has funded several wireless companies over the past few years.

One wireless company hoping to circumvent the location problem is Teledesic, which plans to launch a \$9 billion LEO satellite-based "Internet in the sky" intended to deliver fixed wireless broadband services to corporate and individual customers anywhere in the world. But this isn't scheduled to happen until 2003, and so far the company has only launched one test satellite. None of its 288 planned satellites are due to go up until 2001 or 2002, according to a spokesperson.

But companies such as Orbcomm and Leo One USA have already deployed smaller satellite networks, and analysts from New York-based Ascent Communications Advisors say the LEO services market could top \$2 billion by 2002.

Another promising wireless technology is Local Multipoint Distribution Service (LMDS),

Continued on page 44



John Gilbert, chief technology officer of Rudin Management, says wireless has a strong presence in his firm's cutting-edge office building located at 55 Broad Street in New York.

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Continued from page 41

which vendors say can transmit a staggering amount of data — the equivalent of several hundred T-1 lines. Compare this with the downstream capacities of 1.5M bit/sec for a T-1 line, 7M bit/sec for asymmetric digital subscriber line and 45M bit/sec for a T-3, and it's easy to see wireless technology's appeal.

There is a downside, of course: LMDS works over a maximum distance of three miles and requires a fixed antenna with an unobstructed path. And services are four to five years down the road.

Still, Pioneer Consulting expects the U.S. LMDS market to hit \$6.5 billion in a decade, with most service going to small businesses.

Last spring, the federal government auctioned off a huge allocation of spectrum for LMDS. The big winner was WNP Communications, which bought 40 licenses covering 105 million points of presence for \$187 million — the most spectrum ever licensed to one company. In January, NextLink of Bellevue, Wash., acquired WNP for \$542 million, and now owns exclusive LMDS rights in about 95% of the 30 largest U.S. markets.

Scanning the spectrum

When you consider the vast number of network products and services competing for investment dollars, the \$776 million invested in wireless truly is notable. But not everyone thinks the raw numbers necessarily translate into a plethora of services for network managers.

"The number of companies focusing on exploiting copper or more conventional in-building wiring — whether in the LAN or the WAN — vastly outweighs the investments in companies focusing on wireless media," says Peter Wagner, a general partner at venture firm Accel Partners in Palo Alto.

One wireless company drawing big bucks is

Wireless money magnets

Listed below are the wireless start-ups that have attracted the largest amount of funding since the fourth quarter of 1997, according to the PricewaterhouseCoopers/Network World Venture Capital Survey.

COMPANY	PRODUCT OR SERVICE	AMOUNT RAISED (NUMBER OF ROUNDS)	INVESTORS
Formus Communications	LMDS provider	\$82.2 million (3)	BancBoston Capital
Triton Network Systems	Local loop access	\$40.4 million (2)	Adams Capital Management
Comm Site International	Transmission facilities	\$37.1 million (3)	Edison Venture Fund
AirNet Communications	Telco base stations	\$34.4 million (2)	Adams Capital, Patricof & Co.
Unwired Planet	2-way handheld datacom	\$33 million (1)	Greylock
SpectraSite Communications	Owns, leases towers	\$28 million (2)	J.H. Whitney & Co.
Metawave Communications	Management systems, tools	\$26.2 million (2)	Worldview Technology Partners
Unisite	Site sharing services	\$22 million (2)	AT&T, Battery Ventures
XYPoint	911 services	\$17 million (1)	FBR Technology Venture Partners
Radio Local Area Networks	Wireless LAN products	\$15.2 million (2)	Cisco, Draper Fisher Jurvetson

Formus Communications, a Denver-based broadband wireless services provider. Formus landed a \$55 million venture round in the fourth quarter of 1997, which was the largest single funding deal made in the five quarters that *Network World* has been participating in the survey. Another wireless start-up, Triton Network Systems of Orlando, raised \$40.4 million in two venture rounds in the fourth quarter of 1997 and the second quarter of 1998.

Further, many of these firms are pursuing foreign markets. Formus, for example, is targeting its high-speed wireless broadband services to business customers in Latin America, Europe and the Asia/Pacific region. Others looking overseas include African Communications Group, based in Cambridge, Mass., and ARIA Wireless Systems of Buffalo, N.Y.

Still, there is no shortage of vendors aiming their wireless products and services at the corporate domestic market. Among them are:

- Wavespan of Mountain View, Calif., which sells a wireless Ethernet bridge for enterprise applications.
- Phoenix Wireless of Maitland, Fla., a provider of wireless local loop products and services.
- Aironet of Akron, Ohio, which sells wireless LAN (WLAN) products for mobile PC users.

For John Gilbert, chief technology officer of Rudin Management in New York, the expanding choices for wireless are a far and welcome cry from even three years ago. Rudin runs what may be the most famous wired building in the world — 55 Broad Street in New York, home to dozens of cutting-edge cyberspace companies.

"When we started designing 55 Broad in 1995, my goal was to have as much of it wireless as

possible," he says. "The technology just wasn't there. Now we're seeing companies using wireless distribution systems within the building."

In fact, 55 Broad Street hosts antennas from Winstar and NextLink on its rooftop, so businesses in the building not only have wireless access, they have a choice of carriers. Rudin also plans to use wireless to link the property with the real estate management firm's other holdings in New York and around the world.

"For us, the new model is to include bandwidth as part of the bundle of services that we provide to our tenants," Gilbert says. He's experimenting with leaky feeder cable, a type of partially shielded cable that emits radio frequencies and could be used to tie a WLAN or PBX to a wired network.

Wireless sore spots

Despite experimentation by a few companies such as Rudin Management, WLANs for years have been relegated to a niche market. Plagued by sluggish transmission speeds, high prices and interoperability problems, WLANs have found little acceptance in the enterprise. That may change in the next couple of years, thanks to the 1997 adoption of the IEEE 802.11 interoperability standard.

However, International Data Corp. doesn't expect WLANs to begin hitting their stride until 2001, mainly because a still-higher-speed standard is needed, and customers will want to hold off on deployments until they're confident that vendors are rallying around that standard.

The market for fixed wireless local loop service has also lagged, with only one million subscribers through 1997, according to the Strategis Group. The chief problems have been high equipment costs and spotty performance. However, the New York-based consultancy predicts that wireless local loop subscribers will number eight million by 2000 and 47 million by 2005, thanks to bandwidth demand, lower equipment costs and less resistance from enterprise customers.

Wireless hasn't done much for mobile computing, either. "Mobile data has been a disaster," says Adams Capital's Frezza. "There have been all of these unfulfilled expectations about the road warrior getting data to his desktop."

Mobile computing has faced two obstacles. For one, as wireless users move around, their connections fade in and out. The other problem is that most hardware made today isn't suited for complex data transmission.

"The reason the PalmPilot has been so incredibly successful is it didn't try to bite off too many appli-



Bill Gemmell, senior vice president of operations for Boston Coach, outfitted the company's drivers with wireless handheld computers used to stay in touch with dispatchers.

cations," says AT&T Ventures' Horton, who says this is the same reason Microsoft's Windows CE hasn't done well. "Microsoft is trying to bring the desktop to a wireless form factor, and it's too small. Data input is next to impossible."

Similarly, Frezza predicts isolated successes in the use of wireless mobile data hardware. One device that holds promise, he says, is the \$400 BlackBerry Mobile device made by Research in Motion of Ontario. The device has a tiny keyboard and lets users send and receive Microsoft Exchange e-mail.

As limited as the prospects may appear for mobile wireless computing, a few corporate customers are having success with the technology. Boston Coach, an executive sedan service based in Everett, Mass., uses mobile wireless technology to enable dispatchers to communicate with drivers in Boston and Washington, D.C.

The company switched from a cellular phone system because dispatchers could only book 800 rides per day, far below the amount the 180-car Boston fleet could handle. "We got so large in Boston that we couldn't operate anymore," says Bill Gemmell, senior vice president of operations.

Boston Coach hired Dynamic Mobile Data of Somerset, N.J., to

develop dispatch software to run on Hewlett-Packard 360LX handheld computers.

Powered by BellSouth's wireless network, the application allows drivers to give status reports using hot keys on the handheld device. Dispatchers work much faster with the new wireless data system, allowing Boston Coach to almost double its

average daily ride capacity in the Boston area.

Gemmell says it cost Boston Coach \$150,000 for the software and about \$750 per car for the handheld computers. He expects the service to pay for itself over the approximate three-year lifetime of the hardware.

While Boston Coach was ready to give up its cellular service, one of the biggest challenges wireless vendors face is persuading customers to drop their current carriers.

"Our main competition is always the incumbent local exchange carrier, whomever the incumbent is in the area," says Bill Rouhana, chairman and CEO of Winstar, which primarily offers its services to small and mid-size businesses but which last year launched a division for large accounts.

To win business, Winstar and other wireless vendors rely on underpricing, charging 10% to 20% less than the incumbent local carrier.

Teligent promises any potential customers the same service they're now getting — local phone service, long distance and Internet access — for 30% below what their incumbents are charging.

While many industry observers believe that wireless service prices will drop, Accel's Wagner isn't sure.

"What you're seeing today has very little to do with the actual economic

cost of delivering the service and a lot to do with regulation," he says. "The prices being charged are being set by a combination of a regulatory labyrinth and a monopoly pricing model, and as a result there's an umbrella to operate under."

Preparing for wireless

Unless your firm is buying hundreds of mobile computing devices, you won't have to do much to take advantage of wireless technology, says Battery Ventures' Dages.

The service providers will likely offer one-stop shopping and handle installation.

Whether wireless is coming soon to an office park near you may depend on your location and on how quickly vendors can overcome technical challenges.

"The history of wireless networks is that it's always taken a lot longer to work out the bugs than they ever think it's going to take," AT&T Ventures' Horton says.

Given that sobering assessment, network managers should treat wireless for what it is — promising technology that is not quite ready for prime time.

Nerney is a former senior editor of Network World. He can be reached at chrish@tiac.net.

**More
Online**



- Ask Todd Dages of Battery Ventures questions about the wireless market and which hot start-ups his firm funds.
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- Learn more about wireless technologies, products and services.


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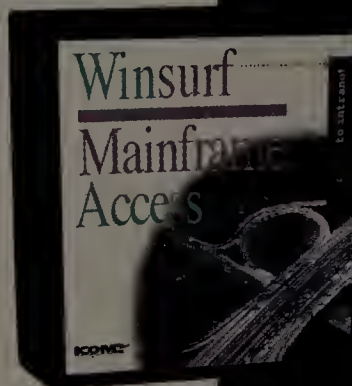
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It's Your Future

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DIGITAL POWERLINE SHORTS OUT IN U.S.

BY NEAL WEINBERG

A year ago, Nor.Web unveiled its grand vision of turning the broadband derby into a three-horse race, with electric utility companies riding a high-speed data service called Digital PowerLine (DPL) to a come-from-behind win over digital subscriber line (DSL) and cable modems.

But today, after spending millions of dollars on R&D, DPL is DOA in the USA, at least as far as corporate networks are concerned. Nor.Web, a joint venture between Nortel Networks and Britain's United Utilities, ran into a combination of technological, economic and competitive hurdles that forced the company to essentially abandon the North American market and focus instead on Europe.

Don't pull the plug on DPL just yet, though. At least three companies, including Microsoft, are taking the basic concept and applying it to consumer and small business markets.

The idea behind DPL is relatively straightforward. If high-speed data can be pumped over copper phone lines, then why not copper electric utility lines? After all, electrical lines reach virtually every home and business and the power companies are every bit as equipped as telcos to handle billing and customer service.

John Laycock, director of new enterprise development at Nor.Web, says his company has developed technology for translating digital datastreams into radio frequency transmissions that can be carried across electric power lines. "We are effectively putting radio waves down the copper," he says, referring to the low-voltage copper wires that run from electric transformers to homes and businesses. Nor.Web engineers have solved the technical problems, such as noise and security, allowing the radio frequency signals to be carried alongside the electrical current.

The result is essentially a 1M bit/sec LAN, based on the same architectural principles as a microcell used for cellular phone transmissions, with an effective range of 300 meters from the base stations. And there's the rub.

The power grid in Europe is based on 220-volt transformers that each serve about 200 premises, while the U.S. uses 110-volt transformers that serve only five to 10 homes each. DPL base station devices, which sit between the transformer and the premises, cost roughly \$5,000 each, so Nor.Web could service 200 customers in Europe for \$5,000 while it would cost \$100,000 to bring DPL to 200 customers in the U.S.

Nor.Web and others are working on ways to move the base stations deeper into the core of the power grid, so each could serve many homes, but until that happens, don't expect DPL deployments in the U.S.

Even if that hurdle is overcome, the business case for

Hurdles stall deployment of technology for carrying corporate data over electric power lines, but hope remains for a small business and consumer rollout.

DPL in the U.S. would still be weaker than in Europe, Laycock says. For one thing, in most European countries, you can count the number of electric companies on one hand. This means if Nor.Web sells DPL to one or two top players in a particular country, it could win a sizeable percentage of the market in that country. But there are more than 3,000 utility companies in the U.S., making the U.S. a much harder market to crack.

electrical connections in the consumer market.

- Intelogis, a Novell spinoff that's adapting Novell Embedded Systems Technology to the electric power line, reached the market first with a product called the Passport Plug-In Network. For \$199, a customer gets three adapters, which plug in to any electrical outlet and connect to PCs and printers via parallel port cables. The result is a LAN for sharing files, printers and Internet connections with no new wiring.

- Enikia is developing an Ethernet transceiver that will allow customers to create a 10M bit/sec home network over existing electrical circuits. The chipset, which Enikia would sell to other vendors, is expected to ship by year-end.

- Intellon, another chipset maker, licensed to Microsoft a technology that can deliver data rates of 1M bit/sec over existing power lines. Microsoft has not announced when products will ship.

These vendors are competing against companies selling LANs over existing telephone wires through the Home Phoneline Networking Alliance (Home PNA).

The basic argument in favor of electric lines over phone lines for home networking is that all other things being equal, there are simply more electrical outlets in the average home than phone jacks. Power line proponents have statistics showing that the average home has 2.75 phone jacks, while there are electrical outlets in three of every four walls in a house.

Intelogis argues that its Passport product is ideal for homes and small offices because it requires no new wiring and you don't have to install a network interface card in your PC. Instead, you just plug the adapter in to the wall, connect it to the parallel port on the PC and load some software. File sharing between computers is done in Network Neighborhood in Windows 95/98.

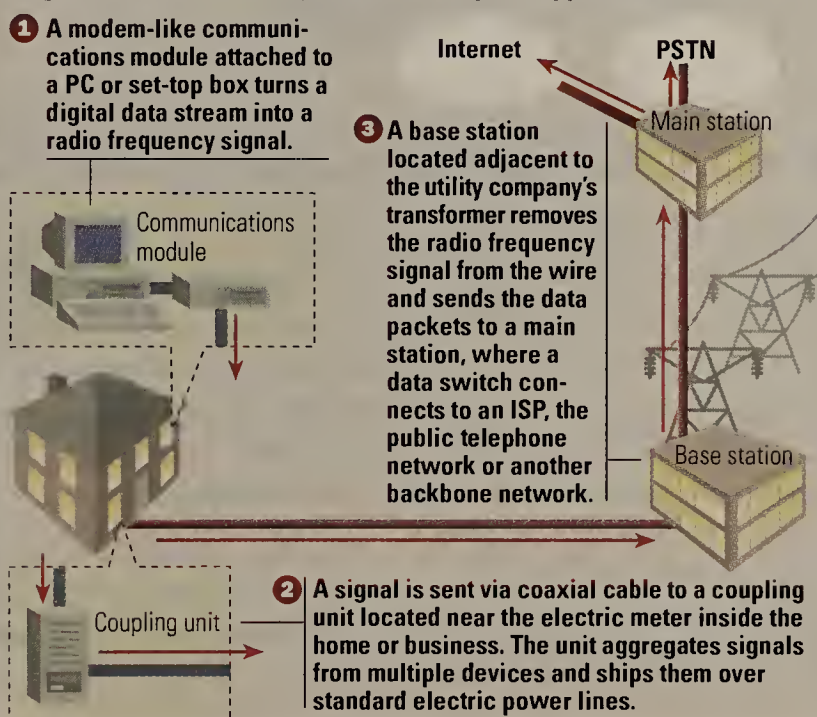
But Passport is also relatively slow, topping out at 350K bit/sec. That's certainly faster than ISDN but much slower than the 1M bit/sec offered by Home PNA vendors and the other power line players.

Enikia is focusing its efforts on the home market with an Ethernet-compatible transceiver that will allow people to use their existing elec-

tric wires to connect PCs, TVs, VCRs, security systems, lights and other devices to a home network. Possible applications include being able to access images from a home security camera over the Internet or drag and drop VCR programming from an online TV listing.

Intellon is optimistic about power line networking in the home and as a regional Bell operating company bypass strategy. Kurt Kyvik, director of marketing communication at the Ocala, Fla., company, says there is behind-the-scenes interest in avoiding local-loop access charges through use of the power grid, but at this point, no one is prepared to announce any deployment plans. ■

Digital PowerLine: A powerful way to bypass the RBOCs



Also, vendors are racing to deliver DSL and cable modems in the U.S. This means the market window may be closed here before DPL becomes viable. The playing field is more open in Europe, Laycock says.

He adds that the potential for DPL goes far beyond simply providing PCs with fast Internet access. Eventually every electric outlet in the house could have an IP address, which would allow users to do all kinds of things over the World Wide Web, including checking the refrigerator-cam to see if they need to pick up milk on the way home from work.

At least three vendors have picked up on the home network theme and are pushing the use of existing

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There are two constants in IP addressing. First, no one is going to remember a numeric IP address as easily as a catchy domain name. Second, most networks don't have enough IP addresses for every user. That's why we need Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) servers.

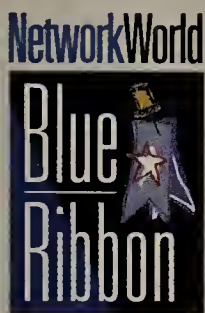
Translating people-friendly domain names into computer-friendly IP addresses is the job of a DNS server; assigning users temporary IP addresses when they log on to a network is the responsibility of a DHCP server. To be most effective, these tools must work together, keeping DNS databases in sync with DHCP servers as they dole out users' IP addresses. The integration between DNS domains and DHCP pools — banks of IP addresses that are available to assign to clients — is called Dynamic DNS (DDNS).

Early this year, we put five Windows NT-based DNS/DHCP servers to the task. Shadow IPserver

Product: Shadow IPserver 3.023

Vendor: Network Telesystems

Easy installation combined with inherent scalability, protocol support and fault tolerance clinch the Blue Ribbon for Shadow IPserver 3.023 from Network Telesystems.



3.023 from Network Telesystems (NTS) beat the competition by a narrow margin, earning our Blue Ribbon Award for its easy installation, effective DDNS support and solid features. Nortel Networks' NetID 4.0 followed closely behind Shadow IPserver, hampered only by its more taxing installation procedure and less-effective DNS and DHCP integration. Finishing in third place was Check Point Software's Meta IP 4.1 Standard Edition, which was easier to install and configure than NetID but had a less-complete feature set.

Lucent's QIP Enterprise 5.0 has a comprehensive set of tools, including the best security features of all the products we tested. But QIP's score suffered from a time-consuming and tedious installation. Bringing up the rear were Microsoft's DNS and DHCP managers, which are bundled with NT Server 4.0. On the plus side, NT users don't have to pay any additional cost for Microsoft's built-in tools, which are a snap to enable. However, the tools have limited functionality and are not integrated.

Configuration and administration

Because automating IP administration is the goal of these products, their administration interfaces and tools are a key evaluation criterion. Configuring Shadow IPserver via a Web browser or NTS' bundled IPmanager software is easily accomplished; either method can be performed remotely. Integrating DNS domains and DHCP pools was almost automatic. As soon as we finished the process, the server began

Review

THE NAME GAME

The key to managing IP addresses is DNS and DHCP tools that work well together.

assigning DHCP addresses. Before assigning an IP address, Shadow IPserver pings the address to ensure it's not already assigned.

Managing Shadow IPserver isn't difficult, but NTS has taken a nonstandard approach to DDNS that could be problematic if you ever want to add other vendors' DHCP services. Shadow IPserver doesn't support the standard Berkeley Internet Name Daemon (BIND) format, which links a DHCP address to an available IP address; instead it uses a proprietary management system developed by NTS. Shadow IPserver does support conventional SNMP and NetBIOS Naming Service (NBNS), which provides name-to-address mapping for NetBIOS-based applications.

From a design standpoint, Shadow IPserver doesn't move as smoothly from one task to another as NetID, which has a Web browser interface that is amazing. NetID's Web-based configuration utility made it easy for us to dynamically update DNS databases; we hardly referenced Nortel's tutorial. In addi-

powerful tools should be able to handle just about every aspect of enterprise IP management. QIP fully supports DDNS, SNMP, BIND 8 and NBNS; it also supports sophisticated Open Shortest Path First routing.

Configuring Microsoft's DNS and DHCP managers can also be a bit tricky at first. The biggest drawback is Microsoft's lack of DNS and DHCP integration. Microsoft doesn't support DDNS, so its DHCP server can't dynamically update the local DNS server when an IP address is assigned to a new DHCP client. Instead, you have to manually enter the DHCP pool of addresses into the database from the server console.

To its credit, Microsoft's DNS server will look into the WINS (NetBIOS) server when the DNS server runs into an unknown name. However, if Microsoft had DDNS support — which it plans to add in Windows 2000 — this step would be unnecessary. Microsoft's DHCP and DNS managers also lack support for remote administration, SNMP and BIND.

ScoreCard

	Management 20%	DNS/DHCP Integration 20%	Scalability 10%	Protocol support 10%	Fault tolerance 10%	Security 10%	Installation 10%	Documentation 10%	Total score
Shadow IPserver 3.023	6 x .20 = 1.2	8 x .20 = 1.6	8 x .10 = 0.8	8 x .10 = 0.8	8 x .10 = 0.8	7 x .10 = 0.7	10 x .10 = 1.0	6 x .10 = 0.6	7.5
NetID 4.0	8 x .20 = 1.6	7 x .20 = 1.4	8 x .10 = 0.8	8 x .10 = 0.8	8 x .10 = 0.8	7 x .10 = 0.7	7 x .10 = 0.7	6 x .10 = 0.6	7.4
Meta IP 4.1 Standard Edition	6 x .20 = 1.2	8 x .20 = 1.6	8 x .10 = 0.8	8 x .10 = 0.8	8 x .10 = 0.8	4 x .10 = 0.4	10 x .10 = 1.0	6 x .10 = 0.6	7.2
QIP Enterprise 5.0	6 x .20 = 1.2	8 x .20 = 1.6	6 x .10 = 0.6	8 x .10 = 0.8	8 x .10 = 0.8	10 x .10 = 1.0	4 x .10 = 0.4	7 x .10 = 0.7	7.1
Microsoft DNS and DHCP managers	4 x .20 = 0.8	2 x .20 = 0.4	4 x .10 = 0.4	2 x .10 = 0.2	4 x .10 = 0.4	2 x .10 = 0.2	6 x .10 = 0.6	6 x .10 = 0.6	3.6

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

tion to DDNS, NetID supports SNMP and BIND 8.

We used a browser for Meta IP's configuration, which was easy with or without the product's convenient configuration wizards. Meta IP's monitoring features impressed us. The program runs DHCP pool availability statistics and includes an NT performance monitor. Like Shadow IPserver, Meta IP can check the availability of an address before assigning it to a client. Meta IP also supports DDNS, BIND 8 and SNMP.

QIP's initial configuration was slow and painful. We frequently had to refer to Lucent's manuals to first define and then configure the DNS and DHCP servers. Once underway, however, QIP shines. Its

Growth potential

With a growing network, you need to know how well each product can scale as the numbers of domain names and users increase. NTS' Shadow IPserver approaches scalability with a distributed database model similar to Novell's Novell Directory Services. With Shadow IPserver, you assign areas of control to pairs of servers. There is no single database containing the entire DNS. One management station can control any or all of the servers.

Nortel's NetID is designed to work as the lone server for either a small network or a global enterprise. With the manager utility, you can define and assign DNS and DHCP servers to DNS zones and

Net Results



Shadow IPserver 3.023

Network Telesystems
(408) 523-8100, www.nts.com
\$1,000 for 100-address server; enterprise pricing starts at \$5,000 for a 1,000-address server

Pros

- ▲ Easy installation
- ▲ Good management tools

Cons

- ▼ Does not support BIND

NetID 4.0

Nortel Networks
(800) 466-7835 or (408) 988-2400;
www.nortelnetworks.com/products
\$18,300 for fewer than 2,500 users; \$28,500 for 2,500 or more users

Pros

- ▲ Strong management tools
- ▲ Great Web browser interface

Cons

- ▼ Somewhat tricky installation

Meta IP 4.1 Standard Edition

Check Point Software Technologies
(888) 638-2463; www.checkpoint.com/products/metaip/index.html
\$445 for 100 clients; \$4,495 for 1,000 clients

Pros

- ▲ Easy installation and configuration
- ▲ Strong monitoring features
- ▲ Good value

Cons

- ▼ Short on features
- ▼ Weak security

QIP Enterprise 5.0

Lucent
(888) 683-2254 or (610) 725-8535; www.qip.lucent.com
\$2 to \$5 per address based on number of addresses licensed

Pros

- ▲ Powerful management tools
- ▲ Comprehensive security features

Cons

- ▼ Difficult to install and use

Microsoft DNS and DHCP managers

Microsoft
(425) 882-8080; www.microsoft.com/ntserver/nts/default.asp
Bundled with NT Server 4.0

Pros

- ▲ No added cost for NT users

Cons

- ▼ Very limited functionality
- ▼ Lacks DNS and DHCP integration

DHCP pools, allowing you to easily manage a large number of servers.

To handle networks of different sizes, Check Point sells two versions of Meta IP: Standard Edition, which we tested, and Enterprise Edition. The two versions have very similar features. Similar to NetID, the Enterprise version adds automatic integration across multiple DHCP domains, allowing it to scale from small domains to global networks. You can start with the Standard Edition, which supports 100 to 1,000 clients, and migrate to the Enterprise Edition if you need to support more than 1,000 users.

Lucent's QIP is designed for large networks and doesn't scale back very well. For example, QIP must be set up with a primary and a secondary server, ensuring that there's always a redundant server online. This is great for very large networks, but may be overkill for mid-size networks. Given the resources you'll need to set up and maintain QIP, it doesn't make sense to deploy it on anything other than a full-scale global domain.

At the other extreme, Microsoft's services are not designed for scalability, as indicated by their lack of DDNS support. You can't manage multiple Microsoft servers as a group; instead you must update each server from its console. That makes the prospect of managing more than a few Microsoft DNS servers impossible.

Safe and secure

Security and fault tolerance are two features that go hand in hand to make sure your clients can always get IP addresses. Of the five DNS/DHCP servers we tested, QIP offers the highest levels of security, with multiple access levels within each DHCP domain and globally. Fault tolerance is solid because QIP keeps its primary and secondary servers in sync. If the primary server fails, QIP automatically switches to the secondary server.

Shadow IPserver and NetID offer decent security features. Both allow you to set up multiple accounts with varying degrees of administrative authority, including authority across multiple DHCP domains. For fault tolerance, NTS recommends that you install servers as redundant pairs rather than backups. NetID lets you configure backup servers to take over in case of a server crash.

Although Meta IP's administrative features shine, its security features are surprisingly weak. By default, anyone with an administrative password can get access to the server console and globally change the administrator password. This is an uncomfortably big hole. On the plus side, Meta IP's fail-safe features are strong. You can program Meta IP to e-mail alerts if it detects a problem, and you can designate backup servers and overlapping zones. Meta IP will automatically switch over to a backup server if the primary server fails.

Microsoft relies on the NT Server logon for security, so there is no separate DNS or DHCP logon. Microsoft does not provide a separate backup capability for DNS and DHCP.

Getting started

The DNS/DHCP products varied widely when it comes to ease of installation. Setting up NTS' Shadow IPserver took just 10 minutes. Once we supplied the addresses of backup servers and co-servers, Shadow

IPserver automatically found the Windows NT server's preconfigured IP address, subnet mask and gateway. The program then asked us to set up DHCP pools, which we did by creating a range of addresses and a default gateway and subnet mask. Shadow IPserver does not require an outside database, nor does Check Point's Meta IP, which we had no trouble downloading via the Internet.

Nortel makes NetID's installation slightly trickier by packaging the product with Oracle 8. While you don't have to be a database whiz to operate NetID, you do have figure out how to get into Oracle to change the default database size. After that, you need to reboot to restart installation of NetID. Once we rebooted, the installation went smoothly.

The prize for most laborious installation goes to QIP, a database-dependent server that took us two

hours and four reboots to install. After loading a runtime version of Sybase 11.1, which is included, we had to install drivers and make a manual change to the NT registry using Regedit. We also needed to install a Web server (which was not included) to activate QIP's Web-based management. The steps were carefully outlined in the lengthy installation guide, which we had read cover to cover by the time we finished.

By comparison, installing Microsoft's DNS and DHCP managers is easy. You simply access the network control panel, add the services and you're ready to go.

Final analysis

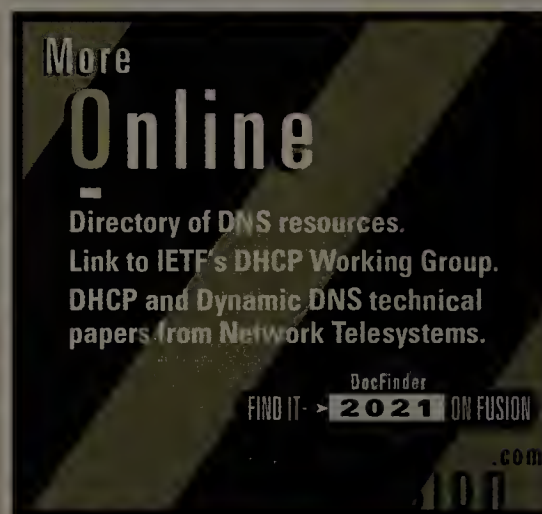
When all is said and done, Microsoft's no-frills DNS and DHCP managers aren't enough for most businesses. Spend the extra money for more-comprehensive IP address management tools. We were most impressed with NTS' Shadow IPserver, an all-around product that's strong in the areas of management, scalability, protocol support and fault tolerance. However, Shadow IPserver could stand to beef up its security, an area best covered by Lucent's comprehensive QIP. If you're willing to labor through a tedious installation process, QIP has a very impressive set of features, especially for large enterprises. Check Point's Meta IP and Nortel's NetID are also solid packages, but security is a weak point with both.

James is the vice president of Lab Services and Anderson is test lab manager at LANquest Labs, an independent test lab specializing in network quality assurance, certification and performance testing services. They can be reached at gjames@lanquest.com and panderson@lanquest.com.

How We Did It

We evaluated IP address management tools from five vendors on the basis of ease of installation and configuration; ongoing management and monitoring tools; integration of Domain Name System and Dynamic Host Configuration Protocol (DHCP) services; architecture and scalability; protocol support; fault tolerance; and security features.

We installed each server on a Class C network linked to a larger Class B network via a router. We used a different domain for each network and attached the DHCP clients to ensure proper configuration. Whenever possible we configured the servers by remote console. Each server was an Intel Pentium II with Windows NT Server 4.0 Service Pack 3 installed.



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Computer Associates' UnicenterTNG is like a hurricane — huge in scope and power. Realizing that its complexity might blow away smaller competitors, CA split off parts of Unicenter to create a family of function-specific integrated software applications. NetworkIT Pro is the resulting collection of network-centric management applications, including advanced monitoring capabilities, programmable automated responses and a shared SQL database.

Unfortunately, despite the unbundling of applications such as backup, security and systems management, NetworkIT Pro still feels more like its blustery parent than the scaled-down management application package it purports to be.

NetworkIT Pro looks at your network via a 2-D topology map, an object viewer application and a distributed state machine. The 2-D topology map gives you a device-centric view of the net. NetworkIT Pro is able to identify most hardware, and places a vendor-specific icon on the map for each device. Clicking on an object's icon pops up a small window showing the object's IP address and device status information. But double-clicking won't enable you to drill down into the device, as you might expect; you must use the right mouse button to select the object viewer or Remote Monitoring (RMON) tool. We found this disconcerting.

NetworkIT Pro contains a diverse set of other utilities, including a good RMON analysis package. The object viewer allows you to select a Management

Review

TOO MUCH, TOO SOON

This scaled-down Unicenter component for general network management isn't scaled down enough.

running the application's autodiscover feature. Once the appropriate subnet masks and discovery ranges are set, NetworkIT Pro uses one of several methods to search for devices on the network. You have a choice of using Fast Address Resolution Protocol, Address Resolution Protocol Cache, Internet Control Message Protocol ping sweep or Domain Name System search to probe the network.

NetworkIT Pro displays a process meter that allows you to see how many subnets, pingable devices and SNMP agents are found as the discovery progresses. The process meter also displays a clock showing cumulative run-time; we liked this feature because it allowed us to estimate how long each subnet discovery would take.

A major disadvantage of the way the discovery process is implemented is the need for multiple discoveries. The initial discovery only populates the database with core information. To use the Switch View you must run the discovery process again to find switches. The same holds true for endpoints running NetworkIT Pro agents. We found the need to run multiple discovery processes to be confusing and time-consuming.

After discovery, Path Doctor helps diagnose the health and performance of a path between two network nodes. Path Doctor requires that all nodes in the path between the systems being tested have a community name string of "PUBLIC" and a subnet mask of 255.255.255.0, or have CA's SuperPing Agent installed. The first two requirements are unrealistic in large nets; our test network has different subnet masks and several wide-area links with hardware we don't manage or configure. Installing agent software on every node isn't practical; without it, we were unable to get Path Doctor to provide us with more than an icon of each endpoint. We found Path Doctor to be of limited use in a heterogeneous net, especially one that's not managed by the same organization from end to end.

On the other hand, we really liked the RMON analysis application and found it to be the best package in NetworkIT Pro. With it we were able to monitor the health of several of our Cisco routers in real-time and historical modes. The application sure beats the old way of monitoring the CPU load of our routers, by firing up a telnet session and constantly typing "show proc cpu." Using the RMON analysis application, we were able to open several windows that displayed the loads on all of our backbone routers. NetworkIT's real-time strip chart provided us with excellent information about the health of our network.

For devices that don't have RMON capabilities, NetworkIT Pro provides a graphical SNMP display tool called DashBoard that allows you to monitor

Net Results

NetworkIT Pro 1.0

Computer Associates
(800) 225-5224, www.cai.com
Pricing depends on server hardware platform. For a 400-MHz dual-CPU Pentium II server, price is \$1,989.

Pros

- ▲ Handled discovery of large network with ease
- ▲ RMON tool intuitive and useful

Cons

- ▼ Requires multiple discovery process
- ▼ Feels bulky and cumbersome
- ▼ Subpar printed documentation and incomplete online documentation
- ▼ Can be confusing to use

ScoreCard

NetworkIT Pro 1.0

Alerts/traps (30%)	6 x .30 = 1.8
Device monitoring (20%)	7 x .20 = 1.4
Analysis (20%)	7 x .20 = 1.4
Ease of use (10%)	6 x .10 = 0.6
Installation (10%)	7 x .10 = 0.7
Documentation (10%)	6 x .10 = 0.6
Total score	6.5

Individual category scores are based on a scale of 1 to 10.
Percentages are the weight given each category in determining the total score.

Information Base and walk through the MIB tree for each device. The distributed state machine provides a display of the properties associated with managed objects, including performance information gathered by the RMON analysis application. A polling engine monitors bandwidth utilization and node response time as well as application-specific information, including end-to-end response times, delays between the user and the application, and application traffic flow.

In addition to reporting, you can configure NetworkIT Pro's event management facilities to take action when problems arise. For instance, if it receives several alerts that indicate a router is performing poorly, NetworkIT Pro can reboot the router.

NetworkIT Pro can use separate Event Managers at remote locations. Each remote Event Manager monitors all the devices on its section of the network and propagates traps and alerts to the central Event Console, thus limiting the amount of information passing across the WAN link.

NetworkIT Pro's database is initially populated by

select performance characteristics using several graph styles. We found this to be a handy feature that was easily configured and performed well.

NetworkIT Pro's reports are straightforward and text-based. While rather plain, they are well-formatted and easy to interpret. The Report Wizard makes it easy to select a range of dates to report on and provides an easy-to-use report navigator.

CA's NetworkIT Pro attempts to give network managers a comprehensive centralized management console for enterprise networks, but we found the product suffers from a lack of cohesiveness; individual features feel more like add-ons than an integral part of the management package. We recommend waiting until a later release to give NetworkIT Pro a try.

Currier is director of data communications at Duke University in Durham, N.C., and the 1998 Grand Prize winner in the Excellence in Campus Networking competition sponsored by CAUSE, a user group for computer professionals in higher education. He can be reached at robert.currier@duke.edu.

Currier is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.





Management

Strategies

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Work like a dog

At a handful of high-tech companies, four-legged friends help brighten the daily routine.

BY TOM DUFFY

Everyone knows someone like Charlie: He's got dozens of toys at the office and is always eager to push aside his work if you want to throw a basketball around or step outside to get some air.

Charlie loves to roughhouse, which isn't a problem at 3Lance Communications, a Boston start-up firm with an informal working environment. But he's got a quiet side, too, and is equally happy if you want to lay down next to him and scratch his belly for a while. As with most beagles, Charlie loves that.

3Lance is one of a few companies that allows its employees to bring their pets to the office. That's probably because Charlie's owner is Richard Perkett, co-founder of the company. Not only is this convenient for Perkett, but his canine companion is also a great stress reliever for the knowledge management software vendor's employees.

"There's a lot of fetch that goes on," Perkett says. "You can go outside and run with him and then come back up and work away. It's total therapy."

Co-founder Jonathan Tang, who teaches meditation courses in his spare time, says owning a pet has a similar relaxing effect.

"It's pretty difficult to take 20 minutes out of the day to meditate, but five minutes to pet a dog? That's great," he says.

Of course, there can be complications. During a meeting of company board advisors a few months ago, Charlie walked beneath the glass-topped conference table and urinated on the floor.

"It was a little embarrassing," Perkett recalls. "I whisked him off into his crate and quietly mopped it up while my partner kept the meeting going."

There are no statistics on the number of companies that allow employees to bring dogs or other animals to work, although these organizations are certainly in the minority. However, pets are welcome in the casual high-tech environments of Autodesk, Excite and Netscape, among others.

At Dragon Systems in Newton, Mass., it's a veri-

table zoo. Tamah Rosker, vice president of human resources at the speech recognition software vendor, estimates that half of the firm's 270 employees bring a pet to work as often as every day or as infrequently as once per month. There are gerbils, lizards and cats, but the vast majority of the pets are dogs, she says.

The company had no official pet policy until two years ago, when several employees told Rosker they were uncomfortable with the pets' presence and wanted some clear rules. For example, one worker who was allergic to dogs complained about coming across a colleague's pooch in the cafeteria.

Dragon responded by drafting a policy that left room for the animals but also addressed the rights of people who don't particularly care for them. While still welcome, pets can no longer roam freely through the building. Baby gates have sprung up in cubicles and four-legged diners aren't allowed in the cafeteria. Employees may also bar pets from attending meetings.

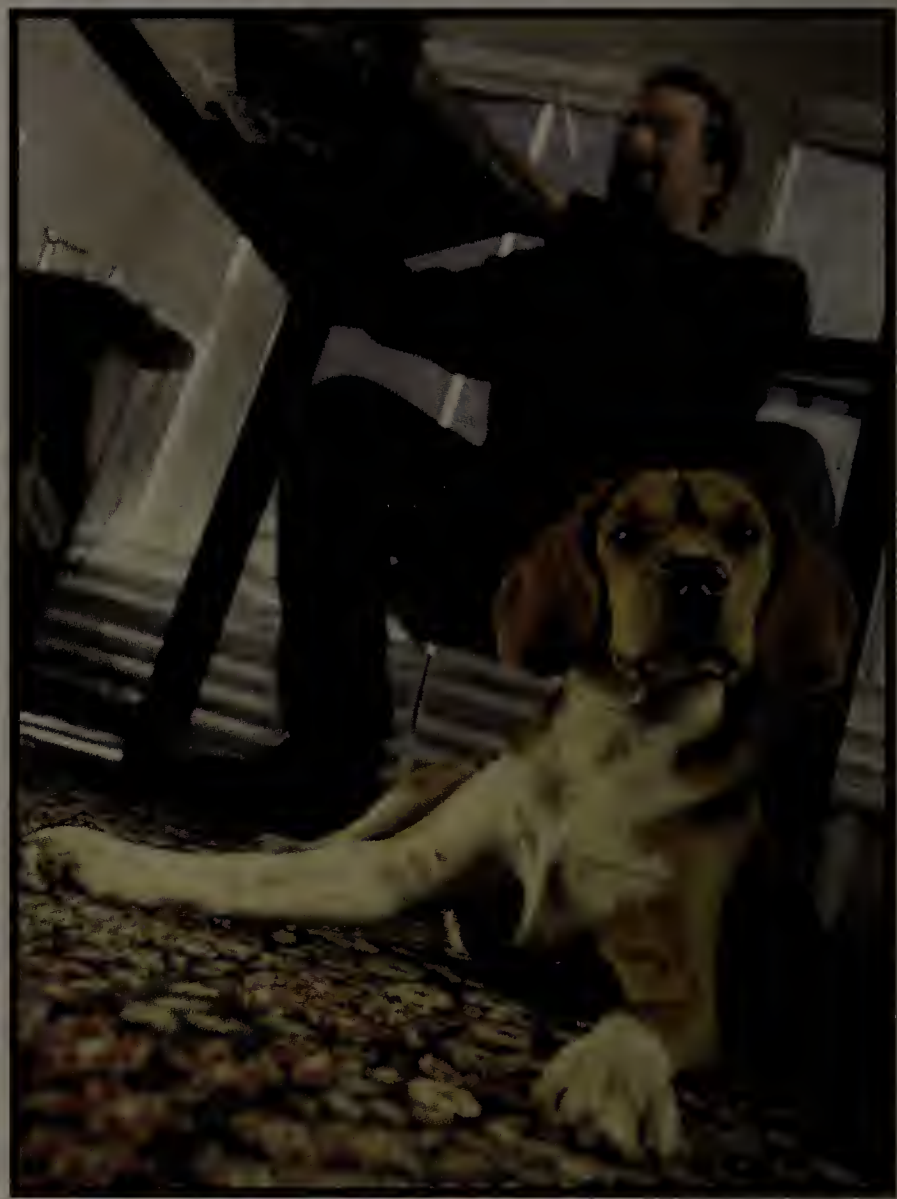
So far, says Rosker, the new rules have prevented the place from going to — pun alert — the dogs. "We haven't had a single issue," she says.

While companies with dog-friendly policies report few serious problems, Ed Kaplan, president of Personnel Dynamics in Highland Park, Ill., does not believe allowing pets in the workplace is a good management strategy. While some people may be able to work longer hours because they don't need to rush home to let their dogs out, the animals pose a needless distraction to others.

"I personally think it would be fairly disruptive," says Kaplan, who advises clients about employee relations and other work force issues.

"Organizations have enough trouble getting people to concentrate on their jobs," he says. "It's not worth the potential conflict between people."

The folks at Argon Systems don't agree. At any one time, there can be as many as three dogs roaming around the building at Argon, a switch vendor in Littleton, Mass. Chris Baldwin, Argon's vice president of marketing, says a pet-friendly workplace makes the



Richard Perkett, co-founder of 3Lance Communications, says his dog, Charlie, is a great stress reliever in the office.

demands of working at a start-up firm more palatable.

"The company is asking a lot of its employees," Baldwin says. "If someone is having a tough day and there's a dog walking around, it helps make it a place where employees want to be."

Argon's main dog-related rule is that the animals have to play well with others. That's true of Samantha, a 2-year-old Labrador retriever, who makes the 35-mile commute to work with owner Bill Snapper at least a couple times per week.

Snapper, a software engineer who helped build Argon's internal network, says that when Samantha isn't under his desk, she's wandering the office searching for crumbs from someone's lunch.

"If it got to the point where it was a nuisance, it would stop," he says. "But it seems to make people happy, so that's cool."

Maureen Liberty, Argon's director of corporate marketing, vouches for that.

"Sometimes I will be banging away on my computer, and Sam will come to say hello," Liberty says. "It just brings a smile to your face. You can't really help it."

Duffy is a freelance writer in Northampton, Mass. He can be reached at tduffy62@compuserve.com.

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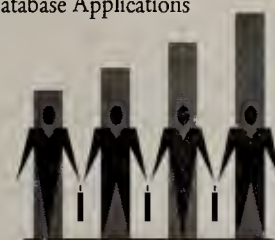
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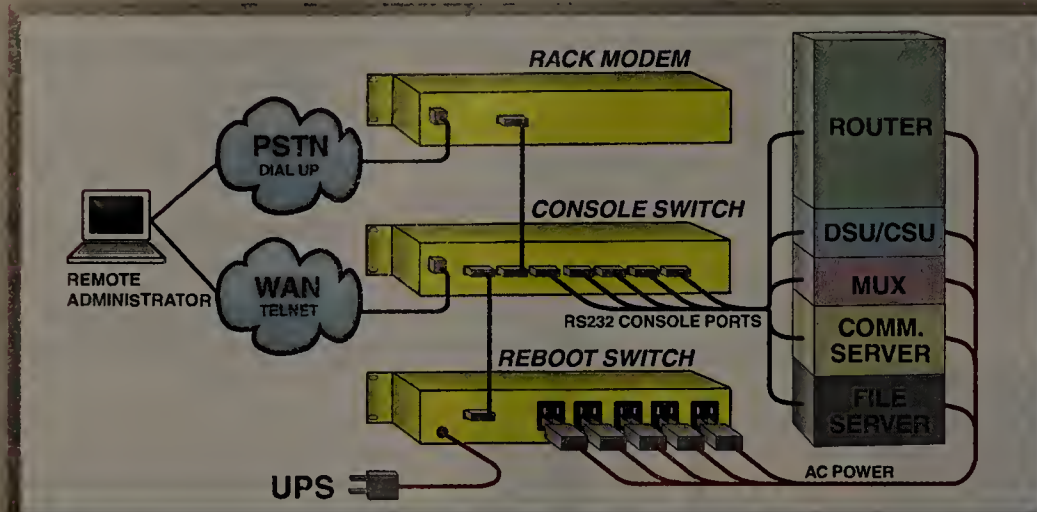
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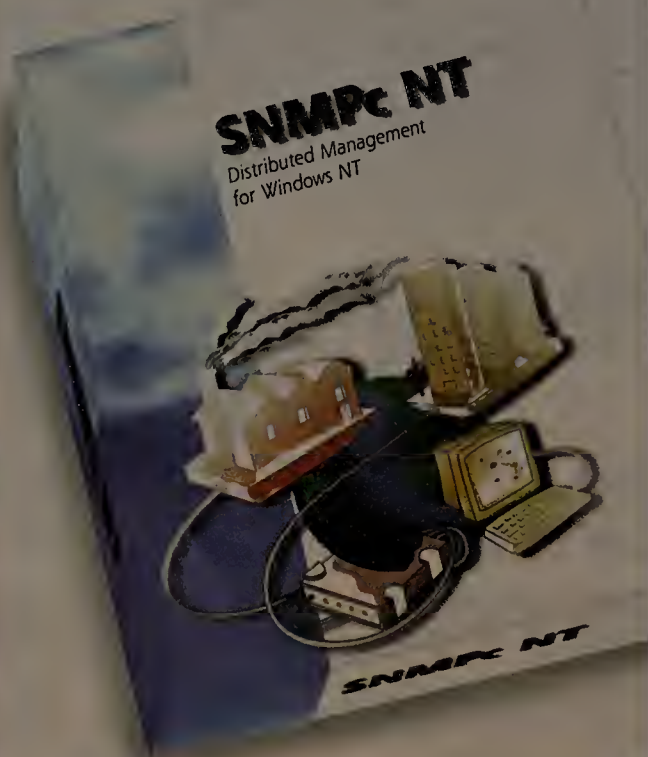
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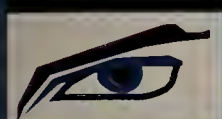
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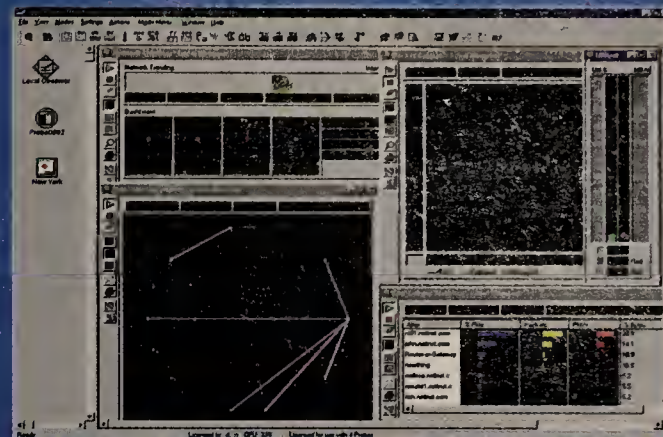
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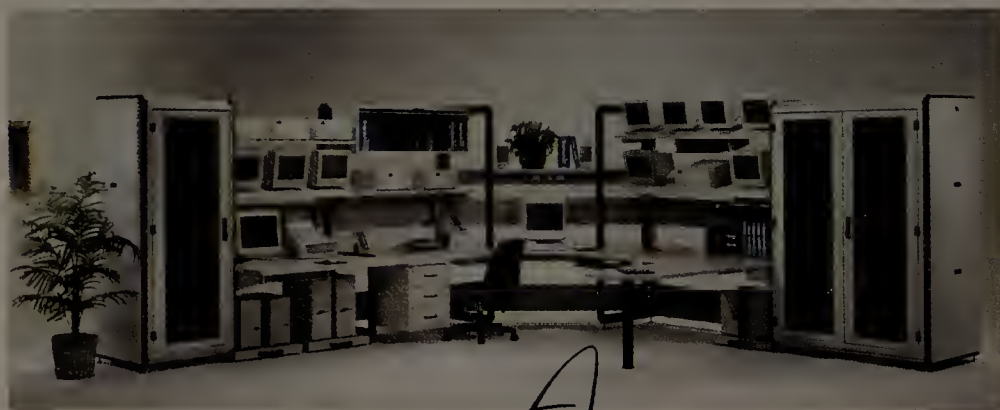
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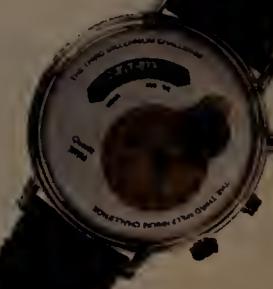
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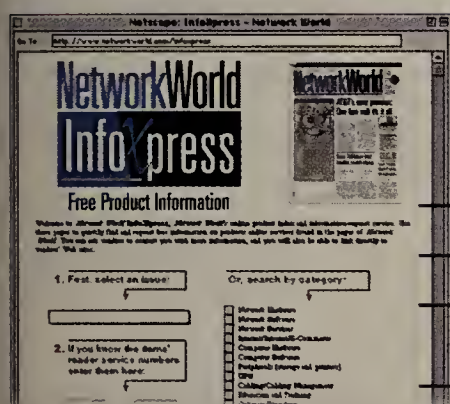
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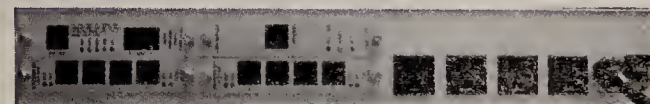
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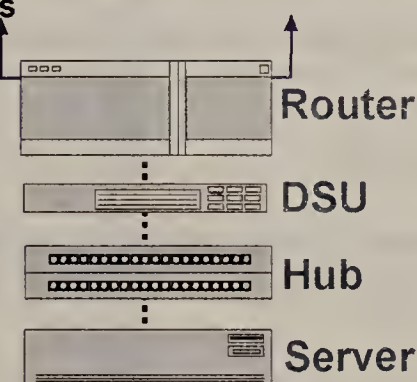
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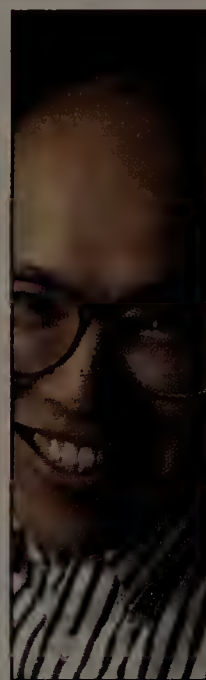
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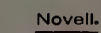
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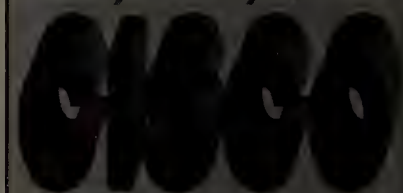


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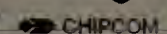
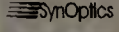
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EDITORIAL INDEX

A	
Alcatel	6
AT&T WorldNet	1
B	
Bellcore	23
C	
Cabletron	9
Check Point Software Technologies	49
Cisco	1,15,25,64
Computer Associates	53
E	
EGain Communications	25
F	
Foundry Networks	25
H	
Hewlett-Packard	6,12
Hummingbird Communications	25
I	
IBM	8,10,15
L	
Lucent	49
M	
MCI WorldCom	23
Microsoft	6,26,49
N	
Netegrity	25

Network Associates	1
Network Computing Devices	20
Network Instruments	1
Network Telesystems	49
Nortel Networks	6,49
Novell	1,14
O	
OpenConnect Systems	15
P	
PC DOCS	25
Q	
Qwest	23
S	
Siemens	23
StorageNetworks	6
Sun	10
T	
Telcordia Technologies	23
U	
Unisphere Solutions	23
UUNET	23

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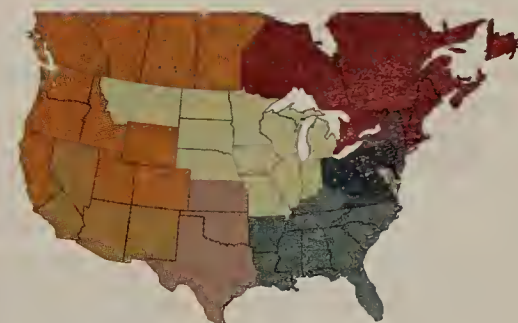
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Cisco,
continued from page 1

enjoyed building the company aren't necessarily the ones who want to take it to the next level.

Some say Cisco, similar to other big internetwork firms, has become more about marketing and managing product distribution channels than about technological innovation.

"Building a company is where the real challenge is, the

half of them in the San Francisco Bay Area. Cobalt has 74.

Such a large organization requires that executives be cautious about what they say. Francis readily admits he is "outspoken," noting that other employees at Cisco used to say, "Don't point Nick unless you want him to shoot."

"As an entrepreneur, you have to be that way" to get the message out, says Francis, CEO of Tavve Software, a Research Triangle Park, N.C., firm that sells net management tools for event correlation and performance monitoring.

Transplanted talent

A sampling of ex-Cisco executives who have spun off in new directions:



Wu-Fu Chen

Then: Cisco's vice president of technologies

Now: Chairman and CEO, Shasta Networks

Steve DeWitt

Then: Head of Cisco's network management business unit

Now: President and CEO, Cobalt Networks



Nick Francis

Then: Head of Cisco's IBM business unit

Now: CEO, Tavve Software

Michael Zadikian

Then: Cisco's SNA product manager

Now: Founder and vice president of marketing, Monterey Networks



Wayne Clark

Then: Founded Cisco's IBM network development group

Now: Chief technology officer, Technauts

real reward," says Steve DeWitt, who was Cisco's vice president of enterprise marketing and then ran the company's network management business unit. DeWitt is now president and CEO of Cobalt Networks in Mountain View, Calif. Cobalt makes dedicated Web hosting servers for ISPs. Because the start-up's work force is so much smaller than Cisco's, everything employees do has more significance, he says.

"In this environment, every hire, every customer, every morsel of your time is critical," DeWitt says. "At Cisco, the company is bigger than its individuals. Here, it's more personal, more intense and more motivational."

Cisco has more than 16,000 employees worldwide, with

will roll out its first products by April, is creating a routerlike box that the company calls a "service-enabling gateway." Service providers would use the product to offer firewall and virtual private network services to a large number of subscribers.

"It's hard to get people to change the model of the thing that's made them successful," says Anthony Alles, president of Shasta. "What we're talking about is really a radical change."

Cisco has a large installed base and complex routing software that it has to consider when making any changes, Alles says. As a start-up, Shasta doesn't have those constraints.

Shasta was founded by Alles and Arthur Lin. Alles was director of product marketing for enterprise ATM and Gigabit

Ethernet at Cisco. Lin was a senior engineer who worked on the Cisco 12000, tag switching and other technologies.

The Shasta co-founders hired Wu-Fu Chen, who was at Cisco for a year after selling his company, Ardent, to Cisco in 1997.

Because Cisco has no mechanism in place for spinning off companies, Alles and Lin felt they had to go outside Cisco. They took advantage of an entrepreneur-in-residence program sponsored by a couple of venture capital organizations.

The venture firms paid the pair to brainstorm ideas for a new company. Once the team had identified a niche and established a plan — about a year ago — the venture capitalists gave the team funding.

Breaking away

Many are taking on new ventures they believe would be difficult to tackle within Cisco. Francis recognized that Cisco has been deficient in network management, so he joined a company he believes is strong in this area. DeWitt found the application of network hardware to be more compelling than the hardware itself — he went to a company that specializes in products that have closer ties with network applications.

Others went to start-ups because they want to change the way people think about routers — a particularly thorny issue in a company practically synonymous with the word "router."

Shasta Networks of Sunnyvale, Calif., which

LIFE AT CISCO

Though some executives have left Cisco for the start-up life, others thrive in the large organization.

Some officials who have come to Cisco through the company's many acquisitions enjoy the tremendous resources Cisco can use to turn ideas into products.

Top executives Cisco has retained from its acquisitions include Chief Technology Officer Judy Estrin, who came to Cisco with Precept Software last year; and Mario Mazzola, vice president and general manager of the work-group business unit, who came to Cisco when it bought Crescendo Communications.

Cisco tries to retain employees that join through acquisitions, mainly with a stock option plan the company also offers to new hires. Cisco boasts that the annual voluntary turnover rate of its employees is just 3%.

The benefits of being a part of Cisco became clear to Larry Birenbaum when his company, Grand Junction, was bought by Cisco in 1995.

"When Grand Junction was acquired by Cisco, there were tears of sadness, not joy," he says. The employees at the start-up had developed a passion for their work, Birenbaum says, and they took pride in the company's uniqueness. They feared that uniqueness would vanish.

But within two months, the Grand Junction team, now the small internetworks business unit within Cisco, saw its sales quintuple. Birenbaum, the business unit's vice president and

Venture capitalists seek people with a proven track record, and Cisco provides that. "People respect the experience folks get at Cisco," says Andy Rachleff, general partner at Benchmark Capital, a firm that invested in Shasta. Cisco fosters a winning attitude as well.

"It's like a self-fulfilling prophecy. If people think they're going to succeed, they probably will," Rachleff says.

With \$1.2 billion in venture funding pouring into Silicon Valley every quarter, more entrepreneurial ventures are bound to spring up this way.

Cisco says that it has no plans to establish a program for building subsidiaries, and it will continue to encourage innovation within the main organiza-

tion. However, Cisco does invest in what it sees as promising network companies.

While Cisco might suffer a short-term hit when employees leave, the industry may benefit as talent is spread around to smaller companies. With knowledgeable people coming at network problems from several different angles, there's a better chance someone will develop what users need.

The Cisco expatriates continue to admire Cisco, from afar.

"Cisco is a phenomenal company," DeWitt says. "I wasn't unhappy there. I felt I was part of history." ■

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Into the fold

Some key executives who have come to Cisco through acquisitions and stayed:

Executive	Title	Came from	Year acquired
Andy Bechtolsheim	Vice president, gigabit switching group	Granite Systems	1996
Larry Birenbaum	Vice president and general manager, small internetworks business unit	Grand Junction	1995
William Carrico	Senior vice president of small/medium business	Precept Software	1998
Judy Estrin	Chief technology officer	Precept Software	1998
Charles Giancarlo	Vice president of global alliances	Kalpana	1994
Bruce Laird	Senior director of marketing	Combinet	1995
Mario Mazzola	Vice president and general manager, work-group business unit	Crescendo Communications	1993

their actions within a large organization such as Cisco, employees can delegate responsibility to many competent people, Laird says.

"Often in a small company, you can see your individual impact on the operation of the company, but it's tough to get the true industry impact that Cisco can provide," Birenbaum says.

— Jeff Caruso

Storage, continued from page 6

StorageNetworks will likely find itself competing against the likes of Compaq and EMC in offering customers what these vendors call storage allocation services.

One key difference, however, is that StorageNetworks will rely on storage gear from EMC and others, whereas Compaq and EMC will largely use their own products.

Industry analysts call StorageNetworks' plan intriguing, but they are skeptical.

Dave Hill, an analyst at Aberdeen Group in Boston, says he could see customers using StorageNetworks' service to test new storage gear before buying it, but wonders if renting would really be less expensive than buying.

Anders Lofgren, an analyst at Giga Information Group in Boston, says StorageNetworks' biggest challenge may be convincing customers that their data will be secure.

Bill Miller, StorageNetworks co-founder and chief technology officer, says the company has given security a lot of thought.

Among other things, the company will use security guards and video cameras, and it will use handprint recognition technology at its POPs.

The company is also addressing reliability issues by enabling storage devices to cover for one another in the case of a system failure, says Miller, who formed StorageNetworks with company CEO and former EMC executive Peter Bills.

StorageNetworks: (781) 370-9700

Network World, 161 Worcester Road, Framingham, Mass. 01701-9172, (508) 875-6400

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AT&T, continued from page 1

states. In addition, the ISP is pushing to finalize its acquisition of IBM Global Services, a deal that will add 1,300 POPs in nearly 60 countries to AT&T WorldNet's network.

The upgrades can't come soon enough for customers

operations at Colorifics, which uses WorldNet as its sole link to the 'Net. "It's not playtime anymore where [our employees] are going online to check basketball scores. The Internet's needed on a daily basis to search for new fabrics, braidings and sequins from our suppliers."

Another dial-up customer with offices in northern Califor-

AT&T now is trying to re-adjust its network capacity plans by deploying up to 10,000 new modems per month as well as new access lines to many of its 500 POPs around the U.S., Klimovich says. She expects all modems on the ISP's network to be compliant with the V.90 56K bit/sec modem standard by mid-year.

Growing pains

AT&T WorldNet has its hands full with a growing number of customers and booming Internet access traffic.

Cities that will have access to upgraded POPs by the end of the month:

Arizona
Phoenix
California
Hayward
La Puente
Modesto
Ontario
Oxnard
Sacramento
San Bernardino
San Jose
Santa Barbara
Van Nuys
Florida
Ft. Lauderdale
Jacksonville
Ocala
West Palm Beach

Idaho
Boise
Illinois
Bellwood
Calumet City
Chicago
Crystal Lake
Elk Grove
Geneva
Joliet
Kankakee
Lemont
Northbrook
Palatine
Peoria
Roselle
Springfield
Summit

Waukegan
Woodstock
Indiana
Ft. Wayne
Kansas
Wichita
Kentucky
Ashland
Maine
Portland
Massachusetts
Cambridge
Framingham
Minnesota
Minneapolis
Missouri
Springfield

New Hampshire
Nashua
New Jersey
Mercerville
New York
Buffalo
Rochester
Ohio
Akron
Cincinnati
Oklahoma
Oklahoma City
Tulsa
Pennsylvania
York
Rhode Island
Providence

Tennessee
Jackson
Johnson City
Memphis
Texas
Dallas
Midland
Vermont
Burlington
Washington
Kennewick
Wisconsin
Madison

Cities that have capacity problems but where upgrade dates have not yet been set:

Indiana
Indianapolis
New York
Armonk Village
Nanuet
North Carolina
Winston-Salem

Texas
Waco
Washington
Silverdale
Tacoma

SOURCE: AT&T, BASKING RIDGE, N.J.

Cities where dial-up problems are occurring, but the causes are unknown:

California
Oceanside
Pendleton
Redwood City
Santa Ana
Connecticut
Hartford
New Haven

Georgia
Atlanta
Iowa
Des Moines
Kentucky
Lexington
Michigan
Detroit

New Jersey
Hackensack
New York
New York
Tennessee
Nashville
Washington
Seattle

such as Colorifics, a Columbus, Ohio, maker of dance costumes.

"It's been very difficult accessing AT&T's network recently, and it's gotten even worse over the last two weeks," says Scott Rice, vice president of

nia, Chicago, Washington, D.C. and New Jersey has been experiencing everything from slow connections to dial-up numbers that no longer seem to work.

A network executive at this firm, who asked not to be named, says he's surprised that an ISP the size of WorldNet would have trouble dealing with a growth spurt.

WorldNet has 1.5 million customers, 200,000 of which joined over the past six months. But such an onslaught is not unusual among ISPs. Consider that America Online has to handle more than 14 million subscribers, and Earthlink, a much smaller ISP, has to keep pace with its one million users.

Rose Klimovich, WorldNet's director of IP network services, reasons that the ISP really hasn't fallen behind with its network, but rather its customer base has grown faster than the company expected.

WorldNet is also trying to make its customers aware of what it calls network "hot spots" — areas suffering from congestion or other problems — through Web site postings. Dan Schulman, an AT&T executive vice president, recently posted a letter to customers telling them how WorldNet is trying to address its current net capacity problems.

For some customers who use POPs in highly congested areas, WorldNet has offered toll-free dial access to uncongested POPs outside their regions at no extra cost. ■

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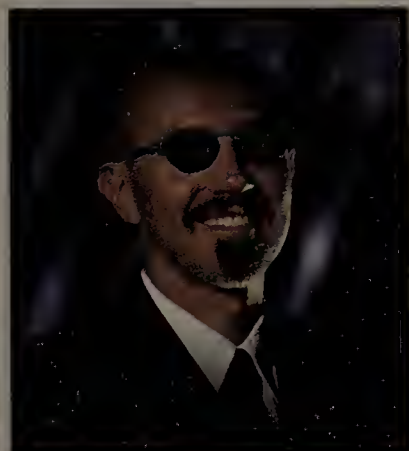
Free speech and shouting madmen

A report from the Southern Poverty Law Center... says the Internet "has, in a sense, empowered the white supremacist community. Typically, hate groups go down when the economy is doing well, but just the opposite is happening... The Internet is allowing the white supremacy movement to reach places it has never reached before — middle- and upper-middle-class college-bound teens."

— Associated Press, Feb. 25, as reported by the Edupage newsletter

In 1998... hate sites on the Internet increased dramatically during the year, jumping to almost 60%.

— Southern Poverty Law Center (www.splcenter.org/)



MARK
GIBBS

Unfortunately, this is what free speech really means and what the First Amendment allows.

Never in history has there been such a powerful and immediate way to get a message out, and we are really, really badly equipped to deal with the consequences. And it is

only going to get worse.

At the heart of the problem is that we've gone from the technoscenti coaxing a text-oriented, academic internetwork to today's hoi polloi-driven, multimedia Internet. When anyone with \$1,000 can create and drive his own media machine, the things that our culture values, talks about and acts upon must change. And while there are undeniable benefits to ubiquitous, inexpensive connectivity, along with that we've given a voice to every madman on the planet.

There are a couple of important trends here that bear scrutiny. The first trend is that people are starting to discover the propaganda potential of the 'Net.

Forget commercial spam, I just received something that looked like born-again Christian spam! It didn't exhort me to buy, sell, trade or do anything other than get the message that

"Christ lives."

While this message was not that much of an event, imagine adding one or two messages to your in-box per day from the more enthusiastic members of each of the major religions. And how about adding messages from the pro-life and pro-abortion groups, the Republicans and the Democrats? The list is endless.

Without doubt, one or two zealots from these groups within the next couple of years will start sending out propaganda on a massive scale. That will trigger their peers to follow. The result will make e-mail effectively useless.

The second trend is the rising tide of pornography. There's so much of it, so easily stumbled across, that you can find yourself retrieving hard-core porn completely by accident. This is a big concern for parents of any child using the World Wide Web and difficult (to put it mildly) in many social and business contexts.

A current popular idea is to use the law to shut down the propagandists, pornographers and other undesirables. But before you start getting all excited and muttering, "Great, let's do something about these sickos and perverts," just consider the consequences.

The problem is that once you compromise the integrity of the First Amendment, you open the door for politically motivated censorship, censorship that would most likely be applied far more widely than just on the Internet.

Unless software vendors, large corporations and activist groups start figuring out how to make the Web safe and e-mail uncluttered, the value of the Internet will plummet and Internet use will decline. Service providers such as Compuserve and America Online will gain huge market share and will get to completely define the online experience. The only people left online will be the madmen shouting at each other.

A grim prospect. What do we need to do? Madmen need not apply to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.

The Big Boss just said he envisions your company becoming the Amazon.com of asphalt or doughnuts or tropical fish or whatever it is you sell.

What do you do?

You could envision *him* as that pointy-haired dolt from "Dilbert," mumble, "Sure thing, Boss," and pretend he'll forget the whole conversation by lunchtime.

Or you might get your butt out to one of those e-commerce conferences that all the better IT consultancies conduct these days. Buzz attended International Data Corp.'s (IDC) **Directions '99** last week in Boston...

and came away convinced that selling doughnuts over the 'Net might actually work with an A-list venture capitalist and the right marketing.

That's how bullish IDC is about what it calls "The New Internet Economy." Let's sift through a few pearls we picked up:

IDC predicts that by 2003, today's 150 million Internet users will have ballooned to 500 million and last year's \$211 billion Internet economy will have mushroomed to \$1.5 trillion.

The bad news is numbers that big defy understanding. The good news, especially for latecomers, is they do show that the e-commerce baby is just now starting to stick his fingers into electrical outlets.

"If the battle for the Internet economy were a hockey game," says **Frank Gens**, senior vice president for Internet research at IDC. "The first period would be just about coming to an end."

We'd all have fewer teeth, too, but Gens did have four excellent long-term strategic pointers for keeping your Internet skaters out of the penalty box. (OK, I promise that's the last hockey analogy; we're switching to sex from here on out.)

• **Anticipate the new Internet user.** He's "moving from Palo Alto to Peoria," Gens says, and, more often than not, he is a she. "We're not talking about the lunatic fringe anymore," he adds.

In other words, expect every putz on the planet to be wired soon, with the possible exception of Dennis Rodman.

• **Target the new online enterprise.** Businesses are stampeding onto the Web like wildebeests charging over a cliff on top of a parade of lemmings. Sure, it's not pretty, but that doesn't mean your company can't pick a few bucks off the pileup.

Two sleepers here: Utilities and health care, although, according to Gens, the latter languishes "in a coma" at the moment.

• **Meet new customer needs.** Up to half of e-commerce will take place outside normal business hours by 2003, IDC predicts. This means 24-7 uptime, vicelike quality-of-service guarantees and load balancing will be essential if you have any designs on a good night's sleep.

• **Build an image as an Internet player.** "If you're not perceived as an Internet player by the market, you're not an Internet player," Gens warns.

Vendors apparently have a lot of work to do in this department. Asked to identify the company they most heavily lean on for e-commerce support, half of the IT executives IDC surveyed said it was not IBM, Netscape or even Microsoft, but rather "Don't Know, Inc."

Directions '99 included mucho talk about the global Internet economy, but two nuggets stuck to my trivia-addled gray matter: Only one-tenth of one percent of China's population is on the 'Net. And, in the fourth quarter of last year, Poles bought more PCs than Russians.

Don't count on these markets for tropicalfish.com.

Finally, here's why Internet stock prices are so nutty, according to keynote speaker **Bob Metcalfe**, who, as everyone knows, founded 3Com and invented oxygen: "Elderly dowager corporations are looking for Web gigolos to take them to the Internet Riviera."

Boy, does that ever trump Greenspan's "irrational exuberance."

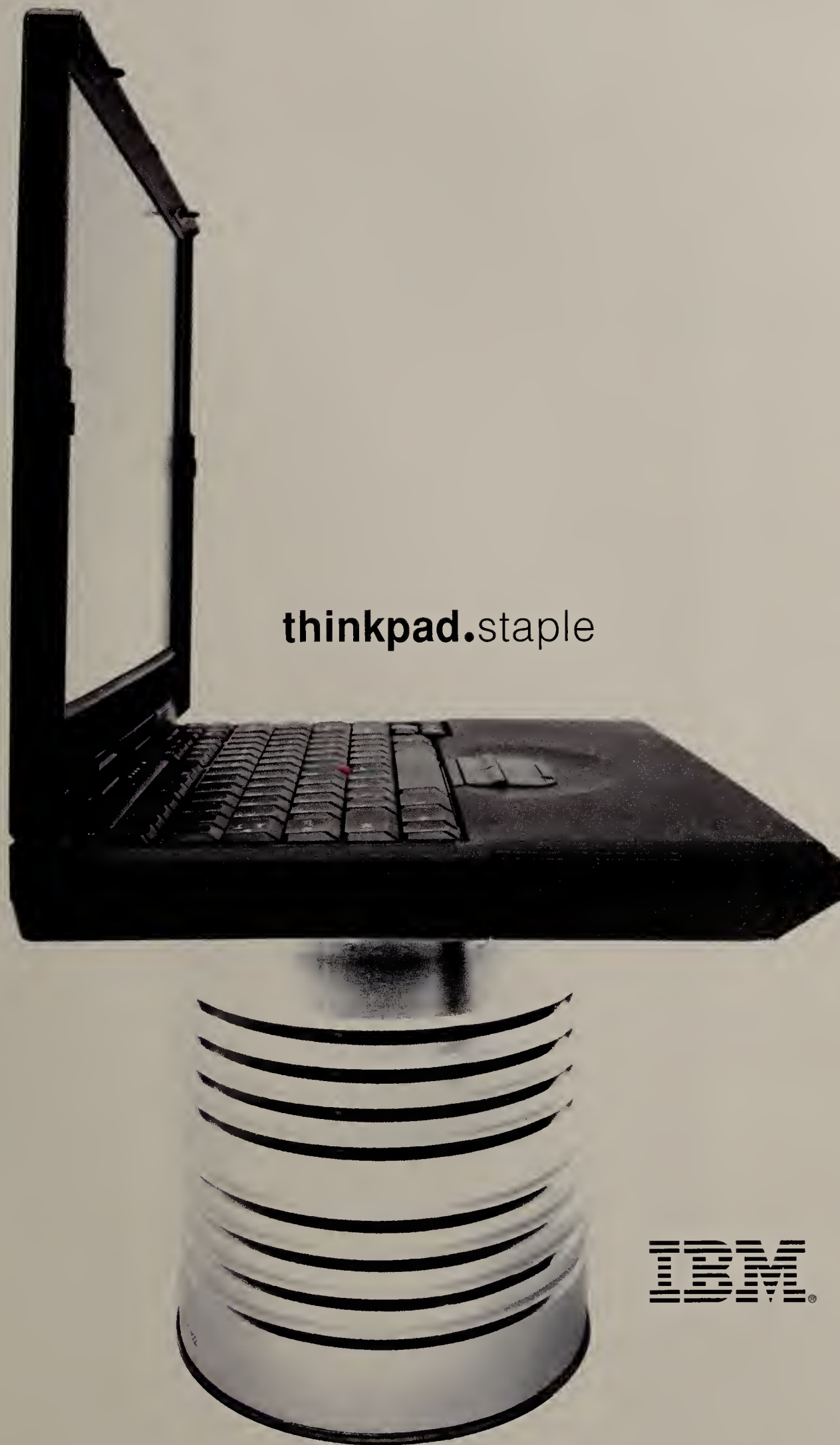
Since McNamara needed a dictionary for "dowager," "gigolos" and "Riviera," you can be certain he needs your Internet-related tips. Contact him at pmcnamara@nwu.com or (508) 820-7471.



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